LAKE ONTARIO FISH COMMUNITIES AND FISHERIES:

2007 ANNUAL REPORT OF THE LAKE ONTARIO MANAGEMENT UNIT

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Lake Ontario Fish Communities and Fisheries: 2007 Annual Report of the Lake Ontario Management Unit

Foreword

The Lake Ontario Management Unit (LOMU) is pleased to release its Annual Report of activities during 2007. LOMU, one of three Great Lakes units, delivers fisheries and aquatic ecosystem assessment and management programs in support of the Great Lakes Branch's vision and mission of achieving sustainable development and aquatic ecosystem for Lake Ontario and the St Lawrence River. LOMU's projects and activities deliver information and management actions to meet the strategic directions and principles of Our Sustainable Future and Ontario's Biodiversity Strategy.

During 2007, LOMU actively pursued the goals and objectives of the Joint Strategic Plan for Management of Great Lakes Fisheries. The Province of Ontario and New York State share responsibility for the fish communities and fisheries of Lake Ontario and the St. Lawrence River. LOMU works in partnership with the New York State Department of Environmental Conservation, within the Lake Ontario Committee, to deliver management support toward shared Fish Community Objectives, and fish community assessment programs intended to evaluate the success of these efforts. These fisheries management and assessment projects are done in concert with Ontario partners (Ontario Ministry of Natural Resources Districts, Ontario Ministry of the Environment, and Conservation Authorities), with Quebec partners, with Canadian federal partners (Department of Fisheries and Oceans Canada, and Environment Canada), with U.S. federal partners (U.S. Geological Survey and U.S. Fish and Wildlife Service), and with international partners (Great Lakes Fishery Commission, Atlantic States Marine Fish Commission).

Preventing the introduction of non-native species and the loss/destruction of fish habitat, controlling the spread of fish disease, restoring native species, and the within these water-bodies continue to be of great concern for both New York and Ontario. In 2007, OMNR worked closely with Canadian federal agencies, provincial governments, various U.S. federal and state agencies and non-government partners to develop and implement plans to protect and restore American eel, lake trout, and Atlantic salmon. Similar plans are being drafted for the conservation of lake sturgeon and for the restoration of deep-water coregonids.

During 2007, LOMU contributed to the bi-national Lake Ontario Lakewide Management Plan (LaMP) and the Remedial Action Plans (RAPs) identified in the Great Lakes Water Quality Agreement. These efforts were focused on meeting ecosystem objectives for the whole lake and for areas of concern. LOMU also participated in planning and delivery of the Canada / Ontario Agreement (COA) respecting the Great Lakes Basin ecosystem. These efforts involve direct coordination with Canadian federal and provincial partners and almost all the Conservation Authorities that border Lake Ontario and the St. Lawrence River. These critical efforts to improve ecosystem health and biodiversity are summarized in the individual project reports included in this document.

LOMU staff use a variety of means with which to communicate with the public, stakeholders, partners, the media, and other resource management agencies. Good communications strategies and products are important to effectively convey results of fisheries assessment, management and enforcement programs. LOMU staff routinely develop communications plans, news releases, public notices, fact sheets, brochures, scientific papers, reports and web products. Consultation helps us to understand stakeholder values, ideas and concerns. Staff interact with the public on a day-to-day basis through phone calls, site visits and contacts made in the field or during enforcement patrols. Staff actively participate on a variety of bi-national and inter-agency committees to share information and expertise, and to develop solutions to problems of common concern in the Great Lakes Basin. LOMU staff respond to a broad range of questions and information requests from the public, stakeholders, the media and other agencies. Staff also provide support to senior managers by developing a variety of communications and briefing

materials relating to the management of Lake Ontario fisheries and fish communities. A strong communications network is critical to making sound resource management decisions (e.g., setting sport fishing regulations, commercial fishing quotas, stocking levels, and fisheries management objectives).

LOMU could not implement its aquatic ecosystem and fisheries assessment and management activities without successful partnerships. LOMU recognizes its many partners and sponsors for their contributions to our program,. Each year, partnerships are developed with a variety of non-government organizations and other government agencies to assist in planning and implementing of a broad range of activities. The details of several notable partnerships are described within the report. We would like to express our sincere appreciation to the partners who contributed to these successful initiatives including Ontario Power Generation, the Ontario Federation of Anglers and Hunters, the Liquor Control Board of Ontario, Australia's Banrock Station Wines, Ontario Commercial Fisheries Association, Mr. David Baverstock, Toronto Region Conservation Authority, Raisin Region Conservation Authority, Fleming College, Trent University, and the University of Toronto.

We are pleased to share the important information about the activities and findings of the Lake Ontario Management Unit from 2007.

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1. Status of Major Species

The following is an overview of the status of major species in Ontario waters of Lake Ontario for 2007. The overview draws largely upon information presented in the chapters and sections that follow in this report. The fish communities of Lake Ontario continue to respond to changes in the ecosystem attributed to the effects of dreissenid mussels.

1.1 Chinook Salmon

Growth and condition of large Chinook salmon in the Credit River in 2007 were similar to 2006, but were still lower than most years since 1989 (see Section 2.10).

1.2 Rainbow Trout

In 2007, counts of wild rainbow trout at the Ganaraska River fishway remained stable. Counts had declined during the mid 1990s (see Section 2.1), consistent with a decline in catch rates from angler surveys (not conducted in 2007), and paralleled by similar declines in lake trout, brown trout, Atlantic salmon and coho salmon in Lake Ontario during the same time-period. Condition of rainbow trout in the Ganaraska River in 2007 declined slightly below the long term average (see Section 2.1). Lamprey marks have increased on rainbow trout to a level similar to the 1970s, before lamprey control (see Section 2.1).

1.3 Lake Trout

The abundance of adult lake trout remains low after a period of decline that began in the 1990s (see Section 2.4). This decline is attributed to the combination of decreased survival of the stocked juveniles and reduced stocking numbers.

1.4 Lake Whitefish

Abundance of lake whitefish in assessment gillnets is very low relative to that of the 1990s (see Section 2.4). Many strong year-classes produced in the late-1980s and early 1990s are aging and declining in both assessment gillnets (see Section 2.4) and commercial gear (see Section 4.2). Reproductive success was very low after the mid 1990s until a strong year-class was produced in 2003 (see Section 2.5). Growth of these young fish is very slow (e.g., age-4 fish from 2003 year-class were 24% less in fork length and 64% less in body weight compared to early 1990s) and age-at-maturity is delayed by at least two years. Fish from the 2003 year-class did not recruit to assessment gillnets in 2004 but began to recruit in 2005 and more fully in 2006—one to two years later than expected. In 2007, age-4 fish from the 2003 year-class were the most abundant age-class in the assessment gillnets (45% of the catch). More recent catches of age-0 fish in assessment bottom trawls suggested that poor year-classes were produced in 2004, 2006 and 2007 but another relatively strong year-class was produced in 2005 (see Section 2.4). The condition of lake whitefish caught in summer assessment gillnets improved after the mid to late 1990s but condition of fish caught during the fall remained low. Commercial lake whitefish harvest declined significantly in 2007 (see Section 4.1).

1.5 American Eel

The total number of eel migrating upstream at the ladders, located at the Moses-Saunders Hydroelectric Dam on the St. Lawrence River, has increased marginally in recent years and the average size of migrants declined (see Section 2.3). While these developments are encouraging, the abundance of eel entering the upper St. Lawrence River and Lake Ontario is still less than 2% of the migrations observed in the early 1980s. Even with the closure of the commercial (2004) and sport fisheries (2005), the abundance of yellow eel in the Lake Ontario/upper St. Lawrence River ecosystem remains low (see Section 7.3). The Ontario Ministry of Natural Resources worked with Ontario Power Generation to stock eels into the upper St. Lawrence River (see Section 7.1) to help maintain eels in this system and to improve biodiversity. In addition, this action may contribute to the fecundity of the global spawning stock. Ontario is continuing to work with management agencies in other jurisdictions, and other stakeholders, including the Ontario Power Generation, Hydro Quebec and the New York Power Authority, to encourage the safe

passage of eels around hydro dams and mitigate barriers to migration (see Section 7.3). Sustainable management practices throughout the range of this panmictic species in North America will be required to restore eel abundance.

1.6 Smallmouth Bass

Assessment gillnet and nearshore trapnet indices indicate that smallmouth bass, having declined in abundance during the 1990s, remain at low to moderate abundance levels in the nearshore areas of Lake Ontario (see Section 2.4).

1.7 Largemouth Bass

Assessment trapnetting and angling survey information indicate that largemouth bass abundance increased in the Bay of Quinte following increases in water transparency and aquatic vegetation in the late 1990s. Their current level of abundance exceeds that of walleye in nearshore areas. Largemouth bass are moderately abundant in other embayment areas of Lake Ontario (see Section 2.7).

1.8 Panfish

Panfish, particularly pumpkinseed, bluegill and black crappie, increased dramatically during the late-1990s in the Bay of Quinte (see Sections 2.4and 2.5). Panfish are also common in other Lake Ontario embayments (Section 2.7).

1.9 Yellow Perch

Yellow perch is one of the most common species in the nearshore areas (see Sections 2.4 and 2.5). Their current abundance levels in Lake Ontario are low to moderate compared to past levels. Yellow perch commercial harvest decreased slightly in Lake Ontario and increased in the St. Lawrence River (see Section 4.1). Yellow perch are currently, by far, the most valuable species in the commercial fishery.

1.10 Walleye

While abundance remains considerably lower than during the late 1980s and early 1990s, the eastern Lake Ontario/ Bay of Quinte walleye population has been relatively stable since 2001 (Section 2.4 and 2.5). For example, assessment gillnet abundance indices for juvenile (age-1 to age 4) and mature walleye indicate that the walleye population has stabilized or increased slightly following their steady decline throughout the 1990s. Further, recruitment indices, based on young of year catch in bottom trawls, indicate that a strong year-class was produced in 2003, and that average (i.e. average for the last ten years) year-classes were produced in 2004, 2005 and 2006. The 2007 year-class index is the 3rd highest since 1995. Catches of these same year-classes at age-1 in assessment gillnets suggest that the 2004 year-class is weaker and the 2005 year-class stronger than first indicated by the trawls. The 2003 year-class also figures prominently in nearshore trapnet catches (Section 2.7) in other areas of Lake Ontario. Based on these recent recruitment levels, the walleye population should remain stable at least through the next few years.

1.11 Prey Fish

The abundance of yearling-and-older alewife was the lowest since the start of the hydroacostic data series in 1997. The levels declined from the previous year when abundant yearlings boosted the overall numbers; very few yearlings were observed in 2007. The abundance of yearling-and-older rainbow smelt was near the average of the historically low values observed in the last four years (see Section 2.6).

1.12 Round Goby

Round goby invaded Lake Ontario in the late 1990s and first appeared in routine Bay of Quinte assessment bottom trawls in 2001 and gillnets in 2002. Goby distribution expanded to include all areas of eastern Lake Ontario and the Bay of Quinte to depths of at least 36 m by 2006. Overall goby abundance appears to have peaked in the Bay of Quinte while continuing to increase in Lake Ontario (see Sections 2.4 and 2.5).

2. Index Fishing Projects

2.1 Ganaraska Fishway Rainbow Trout Assessment

The fishway on the Ganaraska River at Port Hope has been in operation since 1974. During 2007, rainbow trout were counted (Fig. 2.1.1) and sampled for length, weight and age during the spring spawning run. The size of the spring run of rainbow trout has been relatively stable since 1998, and was estimated at 4,057 fish in 2007 (Table. 2.1.1). The abundance of migrating rainbow trout remains at about one-third peak abundances observed during the late 1980s (FIG. 2.1.1)

The body condition of rainbow trout in Lake Ontario was calculated as the estimated weight of a 635 mm (25 in) fish at the Ganaraska River. In 2007, the weights of male (2,922 g) and female (3,005 g) rainbow trout declined from 2006 and were below the long-term average for the data (Table 2.1.2).

In 2007, lamprey marks on rainbow trout in the Ganaraska River were more than three times higher than the average for 1990-2003 (Table 2.1.3). The marking rates from 2004-2007 were similar to levels in the 1970s (Fig. 2.1.2). A high incidence of B1 marks[1] since 2004 indicated very recent attacks relative to rainbow trout migrating into the Ganaraska River (Table 2.1.4).

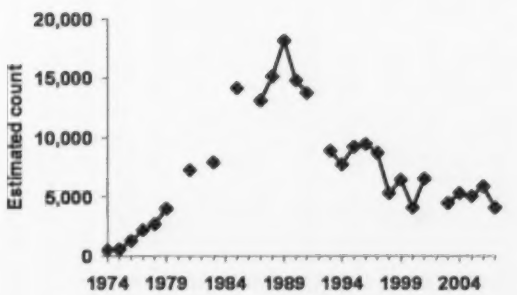

FIG. 2.1.1. Estimated upstream counts of rainbow trout at the Ganaraska River fishway at Port Hope, Ontario during April and May, 1974 to 2007.

TABLE 2.1.1. Observed and estimated upstream counts of rainbow trout at the Ganaraska River fishway at Port Hope, Ontario, during April and May, 1974-2007. Observed counts are the sum of hand-lifted fish and visual or electronic counts. As electronic counts are biased low, they were scaled-up based on simultaneous visual and electronic counts to obtain estimated counts.

Year	Observed count	Estimated count
1974	527	527
1975	591	591
1976	1,281	1,281
1977	2,237	2,237
1978	2,724	2,724
1979	4,004	4,004
1980		
1981	7,306	7,306
1982		
1983	7,907	7,907
1984		
1985	14,188	14,188
1986		
1987	10,603	13,144
1988	10,983	15,154
1989	13,121	18,169
1990	10,184	14,888
1991	9,366	13,804
1992		
1993	7,233	8,860
1994	6,249	7,749
1995	7,859	9,262
1996	8,084	9,454
1997	7,696	8,768
1998	3,808	5,288
1999	5,706	6,442
2000	3,382	4,050
2001	5,365	6,527
2002		
2003	3,897	4,494
2004	4,452	5,308
2005	4,417	5,055
2006	5,171	5,877
2007	3,641	4,057

TABLE 2.1.2. Estimated weight of a 635 mm (25 inch) rainbow trout at the Ganaraska River fishway at Port Hope, Ontario, during April, 1974-2007.

Year	Male		Female	
	Weight (g)	Sample size	Weight (g)	Sample size
1974	3,072	173	3,215	231
1975	2,973	183	3,071	279
1976	3,173	411	3,327	588
1977	2,980	635	3,166	979
1978	3,185	255	3,342	512
1979	3,222	344	3,337	626
1981	3,177	252	3,360	468
1983	2,879	308	3,031	132
1984			3,178	120
1985	3,172	410	3,205	154
1987	2,645	66	3,046	74
1990	2,868	259	3,071	197
1991	2,851	126	3,088	289
1992	2,998	138	3,113	165
1993	2,952	84	3,135	166
1994	3,248	109	3,357	178
1995	2,960	147	3,077	154
1997	3,143	140	3,268	127
1998	3,035	96	3,194	222
1999	3,063	173	3,226	290
2000	3,121	121	3,241	226
2001	2,919	295	3,040	290
2003	3,035	92	3,150	144
2004	3,054	139	3,184	248
2005	2,985	142	3,109	173
2006	3,024	101	3,137	217
2007	2,922	75	3,005	132
Average	3,025		3,173	

TABLE 2.1.3. Lamprey marks on rainbow trout in April, 1974-2007, at the Ganaraska River fishway, in Port Hope, Ontario. Since 1990, A1 and A2 marks[1] were called wounds and the remainder of marks were called scars to fit with historical classification.

Year	Wounds/fish	Scars/fish	Marks/fish	% with wounds	% with scars	% with marks	N
1974	0.083	0.676	0.759	7.0	33.2	36.8	527
1975	0.095	0.725	0.820	8.0	37.2	40.2	599
1976	0.090	0.355	0.445	6.6	23.3	28.1	1280
1977	0.076	0.178	0.254	6.4	13.5	18.2	2242
1978	0.097	0.380	0.476	8.1	28.4	33.7	2722
1979	0.122	0.312	0.434	10.3	22.8	29.8	3926
1981			0.516			36.2	5489
1983	0.113	0.456	0.569	9.7	33.4	38.8	833
1985	0.040	0.154	0.193	3.7	11.5	14.5	1256
1990	0.015	0.083	0.098	1.5	6.6	8.1	470
1991	0.012	0.091	0.103	1.2	7.4	8.4	419
1992	0.035	0.162	0.197	2.9	14.3	16.5	315
1993	0.034	0.165	0.199	3.1	15.3	17.2	261
1994	0.027	0.153	0.179	2.7	13.6	15.3	301
1995	0.017	0.046	0.063	1.7	4.3	5.9	303
1996	0.023	0.030	0.053	2.3	3.0	5.3	397
1997	0.017	0.158	0.175	1.7	12.7	13.7	291
1998	0.035	0.165	0.200	3.2	13.2	15.3	340
1999	0.015	0.086	0.101	1.5	7.5	8.6	477
2000	0.005	0.272	0.278	0.5	23.2	23.5	371
2001	0.028	0.229	0.257	2.5	17.8	18.8	608
2003	0.017	0.176	0.193	1.7	14.3	15.1	238
2004	0.079	0.459	0.538	6.9	33.7	37.5	392
2005	0.084	0.579	0.664	6.9	39.6	41.4	321
2006	0.088	0.577	0.665	6.9	40.1	44.5	319
2007	0.068	0.665	0.733	5.3	46.6	49.0	206

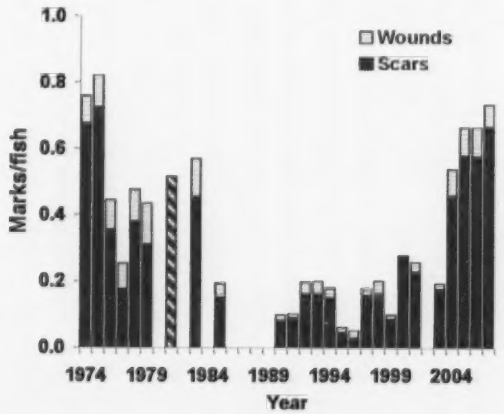

FIG. 2.1.2. Trend in lamprey marks on rainbow trout in April, 1974-2007, at the Ganaraska River fishway, in Port Hope, Ontario. Since 1990, A1 and A2 marks[1] (King and Edsall 1979) were called wounds and the remainder of marks were called scars to fit with historical classification. Scars and wounds were combined in 1981.

TABLE 2.1.4. Classification of lamprey marks[1] on rainbow trout in April, 1974-2007, at the Ganaraska River fishway, in Port Hope, Ontario.

	Marks/fish							
Year	A1	A2	A3	A4	B1	B2	B3	B4
1990	0.000	0.015	0.009	0.009	0.000	0.002	0.017	0.051
1991	0.000	0.012	0.012	0.002	0.029	0.007	0.017	0.019
1992	0.013	0.022	0.025	0.019	0.079	0.006	0.010	0.022
1993	0.011	0.023	0.019	0.023	0.061	0.000	0.008	0.054
1994	0.007	0.020	0.010	0.007	0.076	0.010	0.010	0.043
1995	0.007	0.010	0.017	0.003	0.000	0.000	0.020	0.007
1996	0.013	0.010	0.003	0.003	0.005	0.013	0.000	0.008
1997	0.003	0.014	0.021	0.000	0.000	0.021	0.017	0.086
1998	0.012	0.024	0.012	0.041	0.012	0.003	0.015	0.079
1999	0.000	0.013	0.013	0.021	0.010	0.023	0.013	0.107
2000	0.000	0.005	0.027	0.056	0.000	0.003	0.003	0.183
2001	0.002	0.026	0.021	0.069	0.000	0.000	0.002	0.127
2003	0.000	0.013	0.021	0.029	0.000	0.008	0.004	0.105
2004	0.020	0.059	0.092	0.064	0.171	0.005	0.031	0.094
2005	0.016	0.069	0.075	0.072	0.305	0.003	0.040	0.072
2006	0.028	0.060	0.147	0.050	0.150	0.031	0.047	0.150
2007	0.010	0.058	0.087	0.044	0.432	0.000	0.034	0.068

[1]King, E. L., Jr. and T. A. Edsall. 1979. Illustrated field guide for the classification of sea lamprey attack marks on great lakes lake trout. G.L.F.C. Special Publication 79-1.

2.2 Large Salmonid Predation Impacts on Post-smolt Salmonids

The purpose of this program was to document the predation rates of large salmonids on smaller salmonids, particularly Atlantic salmon, shortly after smolting and/or stocking along the Lake Ontario shoreline during spring. Mortality during the early stages of life in the open-lake is hypothesized to be a critical factor involved in the decline in abundance of rainbow trout and other salmonids in Lake Ontario. Changes in distribution of adult salmon and trout and other prey species may be affecting their interaction and predation on juvenile salmonids. This was the first year (2007) of a 3-year survey, and was intended to help guide the design over the next 2 years.

Sampling was conducted to capture fish using gill nets, set on the bottom or suspended. Each gillnet catch was standardized to represent the total number of fish in 100 m of each mesh size and summed across the ten mesh sizes from 1½-6 inch. Sampling occurred from May 2 to May 31, 2007. Gill nets were set at 27 locations (Fig. 2.2.1) in the nearshore depths of Lake Ontario from Newcastle (78° 35′ longitude) to Collier Shoal (77°50′ longitude). Gill nets were set randomly, stratified by 2 site depth zones, 2 net depth zones, and on an east-west basis by the longitudinal portion of the 5-minute grid. Site depth zones were: 5-10 m (7.5), and 10-20 m (15). Net depth zones were: bottom and

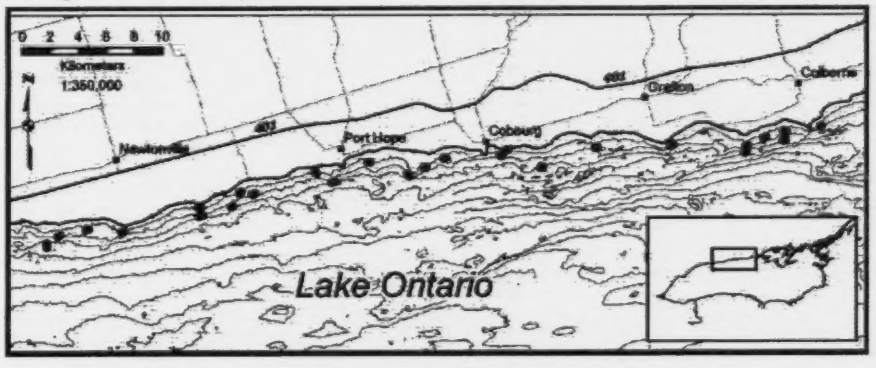

FIG. 2.2.1. Gillnet sites (circles) in western Lake Ontario, sampled during May 2007.

midwater. Within these strata longitude, site depth and midwater depth were chosen randomly. Midwater depth was chosen from 3-meter suspended depth options (2-5, 5-8, 8-11, and 11-14 m) leaving at least 1 m between the net lead line and the lake bottom. In 2007, no midwater sites of 11-14 m were randomly selected, in part due to the lower number of sites with this zone available for selection. A 2-meter gap between the surface and the cork line was left for passage of small boats. Sampling effort was weighted by site depth zone and net depth zone. The 7.5 m site depth and the bottom net depth zones each received about twice the sampling effort as the 15 m site depth and suspended net depth zones (Table 2.2.1). In addition to the normal biological sampling in other LOMU gill net programs, stomachs were collected to examine diet, including predation of salmonids. That analysis is ongoing and its results will be reported at a later date.

Eleven species were observed in the samples. Suspended nets caught only alewife (Table 2.2.1), and catches in the bottom nets also were dominated by alewife. Round gobies were abundant in the bottom nets, followed by lake trout and round whitefish.

TABLE 2.2.1. The average species-specific catch per standard gillnet set and standard deviation (in parenthesis) in western Lake Ontario, during May 2007.

Species	Bottom net		Suspended net	
	7.5 m site	15 m site	7.5 m site	15 m site
Alewife	510.7 (829.9)	786.7 1049.7)	395.1 (804.9)	147.1 (196.2)
Chinook Salmon	0.5 (1.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Brown Trout	2.5 (5.7)	1.3 (2.9)	0.0 (0.0)	0.0 (0.0)
Lake Trout	4.0 (5.1)	11.8 (16.4)	0.0 (0.0)	0.0 (0.0)
Lake Whitefish	0.5 (1.8)	1.3 (2.9)	0.0 (0.0)	0.0 (0.0)
Round Whitefish	9.6 (11.6)	1.3 (2.9)	0.0 (0.0)	0.0 (0.0)
Longnose Sucker	0.5 (1.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
White Sucker	4.6 (10.9)	1.3 (2.9)	0.0 (0.0)	0.0 (0.0)
Lake Chub	1.0 (2.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Yellow Perch	0.0 (0.0)	1.3 (2.9)	0.0 (0.0)	0.0 (0.0)
Round Goby	49.0 (67.6)	65.2 (65.3)	0.0 (0.0)	0.0 (0.0)
Number of samples	13	5	5	4

2.3. R. H. Saunders Hydroelectric Dam Eel Ladder Monitoring

American eel spawn in the Sargasso Sea. A portion of the juvenile population migrates up the St. Lawrence River and into Lake Ontario. Eel reside in Lake Ontario and the upper St. Lawrence River (LOSLR) for approximately twenty years before migrating back to the sea. Monitoring American eel populations provide evidence of dramatic decline in many areas of eastern Canada and particularly in LOSLR. This decline prompted the closure of the American eel commercial fisheries in LOSLR during 2004 and the sport fisheries is 2005. The cause of the decline is uncertain but has been attributed to habitat loss and deterioration (e.g., dams), overfishing, mortality in hydro-electric generating turbines, and potential environmental change in the northern Atlantic Ocean.

An eel ladder was installed at the R.H. Saunders Hydroelectric Dam at Cornwall in 1974 to assist with upstream eel migration. The ladder is operated as a partnership between Ontario Power Generation and Ontario Ministry of Natural Resources. During 2006, a second eel ladder (Moses ladder) was constructed and began operation on the U.S. portion of the Moses-Saunders Power Dam.

This section provides estimates of the number of eel ascending the Saunders ladder during 2007 and biological characteristics of the migrating eel.

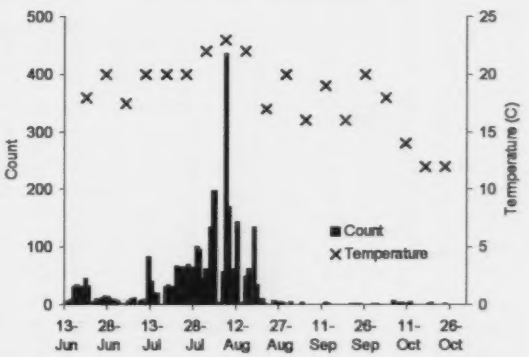

FIG. 2.3.1. The numbers of eel counted at the top of the eel ladder located at the R.H. Saunders Hydroelectric Dam during 2007. The water temperature at the bottom of the ladder is also provided.

Eel Ladder Operation

The Saunders eel ladder was opened on Jun 5 and closed on Oct 31 (148 days), 2007. Continuous counts of eel migration activity were obtained by a photo-electric counter at the top of the ladder (Fig. 2.3.1).

A total of 2,689[1] eels were counted during the entire period of operation after removing the false positive

counts (224; 7.7% of total). The first counts at the eel ladder were recorded on Jun 13 and the last ones on Oct 24. The peak period was Jul 19-Aug 18 (2,131 eels; 79.2% of total) with a peak day on Aug 8 with 411 eels. Eels were most abundant in Aug (1,491; 55.4% of total); the lowest number was recorded in Sep (14; 0.5% of total). The low counts during September were unusual in comparison to recent years. Eel activity was recorded at the top of the eel ladder during every hour of the day; (88%) between 7:00 PM and 6:00 AM.

The electronic counts were compared to manual counts, usually once a week, throughout the season. The overall difference of the electronic counter compared to manual counts was 1.1%. The average difference per week of counting was 14.2%. When two outlying counts were removed from the calculation, the average difference was 1.0%.

The number of eels counted this year (2,689) is much lower that the numbers of eel observed during the early 1980s (Fig. 2.3.2, over 1-million eels per year during 1982 and 1983). This year's count is somewhat lower than the number observed during 2006 (8,960 eels). At the Moses eel ladder, a total of 11,344[2] eels transited the passage facility during 123 days of operation in 2007. Combined, 14,033 eels passed the two ladders during 2007 compared to 17,144 in 2006. During 2006, the numbers at both eel ladders were very similar (8,795 at Saunders; 8,184 at Moses). During 2007, almost 4-fold eels were estimated to transit the Moses ladder compared to the Saunders ladder.

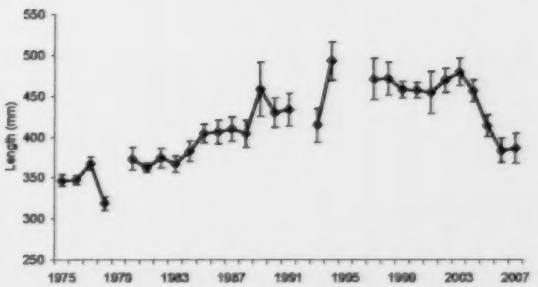

FIG. 2.3.3. Length (error bars are 95% confidence limits) of eel migrating upstream through the eel ladder located at the R.H. Saunders Hydroelectric Dam, 1975-2007.

A sub-sample of 117 eels were collected and sampled for biological characteristics. The average size of eels migrating up the ladder during 2007 (average length 387 mm, range 224-606 mm, Fig. 2.3.3) was very similar to 2006 and continued to show a marked decrease compared to five years ago. Only twice since 1984 (2006 and 2007) have eels, ascending the ladder, averaged less than 400 mm. In 2007, ninety-eight percent of the eels analysed were determined to be female which corresponds sex ratios published in the literature.

[1]Personal communication with Dr. Ron Threader, Ontario Power Generation, PO Box 950, 2 Innovation Drive, Renfrew, Ontario, K7V 4H4. ron.threader@opg.com

[2]Personal communication with Dr. Kevin McGrath, New York Power Authority, 123 Main Street - 15K, White Plains, NY, 10601, United States of America mcgrath.k@nypa.gov

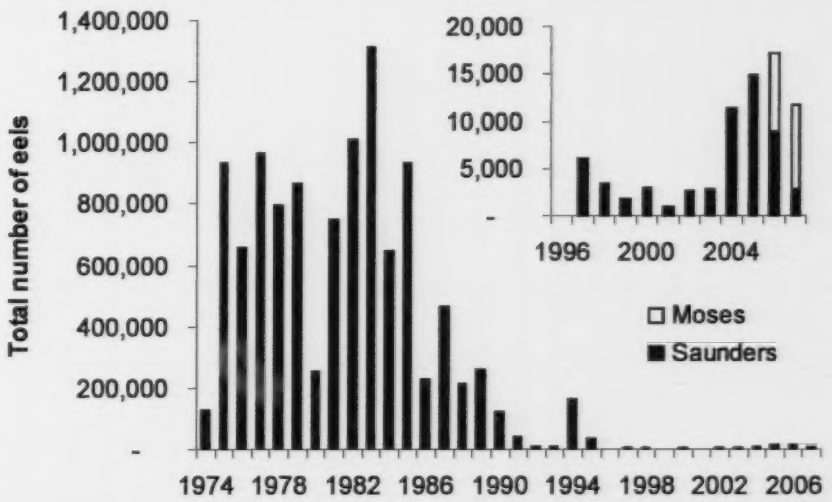

FIG. 2.3.2. Total number of eels ascending the eel ladder per day at the R.H. Saunders hydroelectric Dam, Cornwall, Ontario for 1974-2007. No counts are available for 1996.

2.4 Eastern Lake Ontario and Bay of Quinte Fish Community Index Gillnetting

Assessment of the fish communities of the Bay of Quinte and eastern Lake Ontario during 2007 continued a 49-yr time-series of gillnet surveys. Bottom set gillnets were used at fixed index netting sites (Fig. 2.4.1) in eastern Lake Ontario (ranging in depth from 2.5-140 m) and the Bay of Quinte (ranging in depth from 5-45 m), as they have been annually beginning in 1958 with the Hay Bay site, in the Bay of Quinte. Gillnets are multi-paneled with mesh sizes ranging from 1½-6 inch (½ inch increments) stretched mesh. Monofilament mesh replaced multifilament in 1992. The gillnetting program is used to monitor the abundance of a variety of warm, cool and cold-water fish species in the eastern Lake Ontario and Bay of Quinte. The 2007 survey was conducted from Jun 18–Sep 7.

Species-specific catches in the gillnetting program are shown by geographic region in Tables 2.4.1-2.4.8 for 1992-2007. Each gillnet catch was standardized to represent the total number of fish in 100 m of each mesh size and summed across the ten mesh sizes from 1½-6 inch. Thirty different species and over eight thousand individual fish were caught during 2007.

More detailed biological information is presented below for selected species including lake whitefish, walleye, round goby and lake trout.

Lake Ontario

Middle Ground

Nine species were caught at Middle Ground in 2007. The most abundant species were yellow perch, white sucker, walleye, northern pike and rock bass (Table 2.4.1). Yellow perch were much less abundant in 2007 compared to the 1992-2007 average. White sucker and northern pike were more abundant in 2007 than in any other year. Walleye were more abundant than their

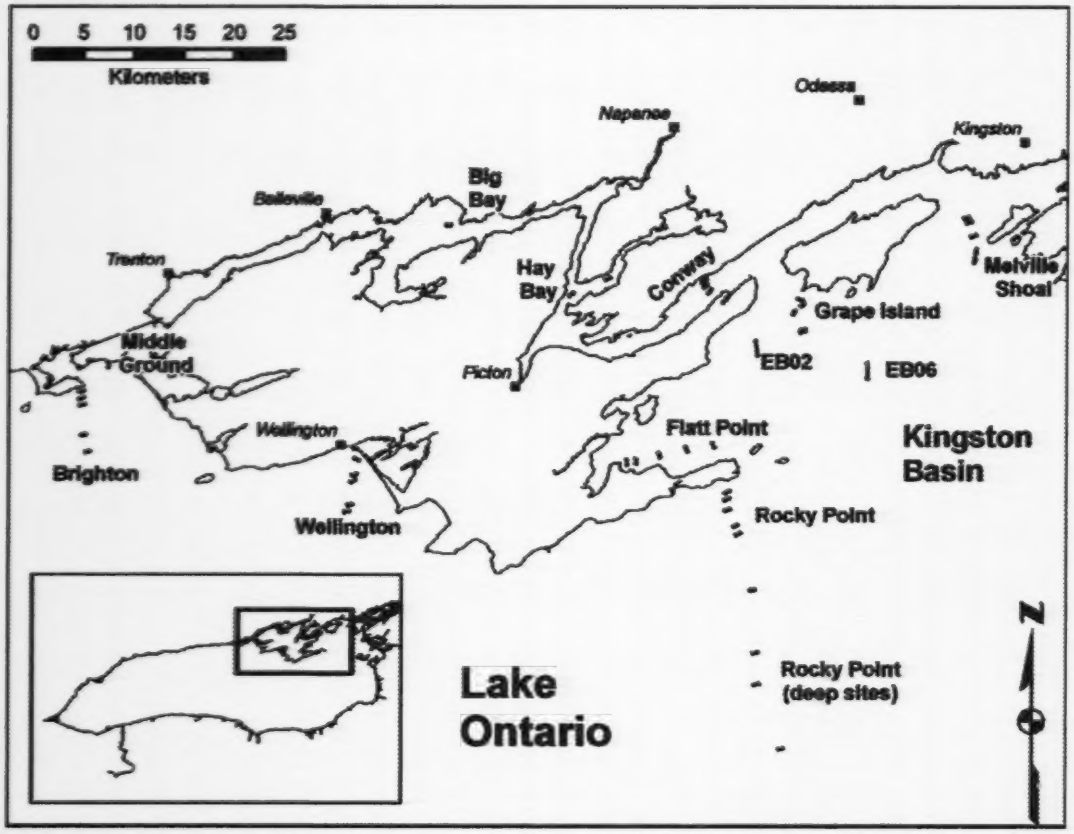

FIG. 2.4.1. Map of northeastern Lake Ontario. Shown are eastern Lake Ontario and Bay of Quinte fish community index gillnetting locations.

TABLE 2.4.1. Species-specific catch per gillnet set at **Middle Ground**, 1992-2007. Shown are the average catches in 1-3 gillnet gangs set at a single depth (5 m) during each of 2-3 visits to a single site (Middle Ground). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Longnose gar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.1
Alewife	30.9	5.5	76.1	90.2	0.0	10.9	0.0	0.0	0.0	5.4	5.4	0.0	0.0	0.0	0.0	0.0	14.0
Gizzard shad	0.0	0.0	0.0	6.6	13.2	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	1.6	1.7
Brown trout	0.0	0.0	0.0	0.0	0.0	3.3	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.5
Lake trout	21.9	0.0	0.0	3.3	0.0	26.3	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	1.6	0.0	3.4
Northern pike	4.4	1.1	1.6	0.0	6.6	3.3	0.0	3.3	0.0	0.0	0.0	3.3	0.0	1.6	1.6	9.9	2.3
White sucker	3.3	2.2	0.0	13.2	19.7	9.9	6.6	23.0	8.2	9.9	20.2	0.0	13.7	4.9	8.2	26.3	10.6
Common carp	0.0	1.1	0.0	0.0	6.6	0.0	19.7	6.6	0.0	3.3	0.0	4.9	3.3	0.0	0.0	0.0	2.8
Brown bullhead	4.4	2.2	1.6	32.9	0.0	0.0	52.6	13.2	3.3	13.2	3.3	14.2	1.6	10.4	5.4	4.9	10.2
White perch	1.1	2.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Rock bass	0.0	3.3	3.3	10.9	3.3	3.3	6.6	32.6	27.2	7.1	1.6	3.3	4.9	3.3	0.0	7.1	7.4
Pumpkinseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Bluegill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Smallmouth bass	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	0.3
Largemouth bass	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Yellow perch	539.8	267.5	455.0	332.7	129.4	281.6	1013.2	419.9	423.7	285.4	400.7	170.1	448.2	193.0	695.6	192.5	390.5
Walleye	19.0	23.0	25.7	16.4	50.3	3.3	0.0	6.6	0.0	1.6	3.3	6.6	3.3	4.9	8.2	23.0	12.2
Freshwater drum	0.0	1.1	0.0	9.9	13.2	0.0	13.2	0.0	3.3	0.0	1.6	0.0	19.7	1.6	0.0	3.3	4.2
Total catch	626	309	565	516	242	345	1118	523	467	326	436	204	496	223	722	270	462
Number of species	9	10	7	9	8	9	7	10	6	7	7	7	8	8	7	9	18
Number of sets	6	6	4	2	2	2	1	2	4	4	4	4	4	4	4	4	57

long-term average and more abundant in 2007 than at any time since 1996. Alewife, a species that was moderately abundant in the early to mid-1990s, has not been caught in the past five years.

Northeast

Eighteen species were caught in the Northeast Lake Ontario gillnets in 2007. The most abundant species were alewife, round goby, yellow perch, walleye, and Chinook salmon (Table 2.4.2). Of these species, all except alewife were more abundant in 2007 than the 1992-2007 average. The cold-water benthic species, lake trout, lake whitefish and round whitefish, declined markedly over the 1992-2007 time-period. Round goby, caught for the first time in 2003, is now the second most abundant species in the northeast region.

Rocky Point (deep sites)

No netting was completed at the Rocky Point deep netting locations in 2007 (Table 2.4.3).

Kingston Basin (nearshore sites)

Fourteen species were caught in Kingston Basin nearshore gillnets in 2007. The most abundant species were alewife, yellow perch, round goby, walleye and rock bass (Table 2.4.4). Alewife and yellow perch were less abundant in 2007 than in 2006 but still above their long term averages. Round goby, caught for the first time in 2003, is now the third most abundant species in the Kingston Basin nearshore region. Lake trout and lake whitefish catches were slightly higher in 2007 than in the last few years. Burbot, which were caught each year from 1992-2004, have not been caught in the last three years.

Kingston Basin (deep sites)

Nine species were caught in Kingston Basin deep gillnets in 2007. The most abundant species were alewife, lake trout, lake whitefish and round goby (Table 2.4.5). Catches of nearly all species declined precipitously over the 1992-2007 time-period. Round goby, caught for the first time in 2004 at these deep sites, are now likely distributed throughout the Kingston Basin, at all depths.

Bay of Quinte

Big Bay

Thirteen species were caught in Big Bay gillnets in 2007. The most abundant species were white perch, yellow perch, freshwater drum, bluegill and walleye (Table 2.4.6). Of these species, white perch and bluegill were more abundant in 2007 than the 1992-2007 average while yellow perch, drum and walleye were less abundant. Black crappie was more abundant

TABLE 2.4.2. Species-specific catch per gillnet set in **Northeastern** Lake Ontario, 1992-2007. Shown are the average catches in 1-3 gillnet gangs set at each of 5 depths (range 7.5-27.5 m) during each of 2-3 visits to each of 3 sites (Brighton, Wellington and Rocky Point). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	218.6	130.8	338.7	439.2	721.6	337.3	897.1	550.8	218.3	385.6	657.0	396.9	474.0	916.2	773.4	307.9	485.2
Gizzard shad	0.1	5.1	0.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Coho salmon	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinook salmon	1.5	5.5	8.3	3.3	2.6	0.9	1.4	0.6	0.0	0.4	1.4	4.1	4.8	1.5	1.5	2.3	2.5
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Atlantic salmon	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brown trout	0.5	0.3	3.0	0.2	0.0	0.7	0.5	0.2	0.7	0.3	3.3	1.2	1.9	1.0	1.3	0.7	1.0
Lake trout	80.7	37.3	69.4	60.9	28.5	29.2	28.2	7.9	22.4	11.8	8.9	3.0	7.5	1.3	3.2	1.1	25.1
Lake whitefish	5.0	9.5	4.8	7.7	2.9	3.4	0.7	0.0	0.7	0.4	0.1	0.8	0.2	0.1	0.2	0.1	2.3
Cisco (Lake herring)	1.3	1.3	1.2	1.1	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.4
Round whitefish	5.9	5.2	2.0	6.8	2.4	0.9	0.5	0.2	0.0	0.0	0.5	0.1	0.1	0.0	0.0	0.0	1.5
Chub	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow smelt	2.5	0.9	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Northern pike	0.1	0.4	0.7	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.4	0.2
White sucker	1.8	1.1	3.8	1.1	0.2	0.4	0.0	0.2	0.2	0.1	0.2	0.0	0.5	0.3	0.1	0.4	0.7
Greater redhorse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lake chub	1.2	0.8	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.2
Common carp	0.4	0.4	0.7	0.0	0.7	0.2	0.2	0.0	0.2	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.2
Brown bullhead	0.0	0.1	0.0	0.0	0.0	0.2	0.5	0.2	0.9	1.2	0.7	1.9	0.8	1.1	0.0	0.5	0.5
Channel catfish	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stonecat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.5	0.4	0.1	0.0	0.2	0.1	0.6	0.2
American eel	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.6	1.4	1.3	2.0	3.3	1.1	0.9	0.0	0.9	0.7	1.3	0.3	0.2	0.7	0.3	0.1	0.9
White perch	0.1	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rock bass	1.5	2.2	2.5	3.3	2.4	1.7	9.7	4.2	2.7	1.1	1.9	4.4	2.0	1.6	1.5	2.1	2.8
Pumpkinseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smallmouth bass	6.1	4.0	4.4	2.0	0.2	0.4	1.8	4.9	0.4	1.5	1.4	1.5	1.7	0.9	0.9	1.1	2.1
Yellow perch	100.4	224.4	97.6	135.7	75.6	76.4	49.9	47.2	63.9	27.8	14.7	40.5	23.3	34.7	24.2	56.9	68.3
Walleye	4.9	6.7	5.6	2.9	1.8	1.8	3.2	2.4	0.8	0.0	1.1	1.2	3.4	4.4	1.8	3.7	2.8
Round goby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.5	71.3	63.3	162.1	18.8
Freshwater drum	1.1	1.9	3.0	0.4	2.6	1.6	0.5	1.5	0.4	0.2	0.2	0.4	1.0	0.1	0.3	0.1	1.0
Total catch	434	439	548	670	845	456	997	621	313	433	693	458	524	1036	873	540	618
Number of species	21	21	20	16	14	16	18	14	14	14	16	19	16	18	16	18	31
Number of sets	90	90	40	30	30	30	29	35	36	60	60	60	60	60	60	60	830

TABLE 2.4.3. Species-specific catch per gillnet set at **Rocky Point** Lake Ontario deep sites (range 60-140 m), 1997-2007. Shown are the average catches in 2-3 gillnet gangs set at each of 4 depths during each of 2 visits to Rocky Point. The total number of species caught and gillnets set each year are indicated.

	Year											
Species	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	30.3	88.0	7.6	0.8	80.6	2.5	60.6	95.1	12.1			41.9
Lake trout	36.5	34.5	42.5	29.6	44.8	41.1	27.4	14.3	12.1			31.4
Lake whitefish	0.0	8.6	5.1	0.4	0.8	0.0	0.5	0.0	0.5			1.8
Cisco (Lake herring)	0.0	2.1	0.5	0.8	0.0	0.8	0.5	1.4	0.0			0.7
Rainbow smelt	3.9	3.3	3.5	0.8	0.0	1.2	0.0	0.0	0.0			1.4
Burbot	1.3	0.4	1.0	0.0	0.0	0.0	0.0	0.3	0.0			0.3
Slimy sculpin	0.0	1.6	0.0	0.4	0.4	0.0	0.3	0.3	0.0			0.3
Total catch	72	139	60	33	127	46	89	111	25			78
Number of species	4	7	6	6	4	4	5	5	3			7
Number of sets	15	16	13	16	16	16	24	24	24	0	0	164

Not completed

Not completed

TABLE 2.4.4. Species-specific catch per gillnet set in the **Kingston Basin** Lake Ontario (**nearshore sites**), 1992-2007. Shown are the average catches in 1-3 gillnet gangs set at each of 5 depths (range 7.5-27.5 m) during each of 2-3 visits to each of 3 sites (Flatt Point, Grape Island and Melville Shoal). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Lake sturgeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1
Alewife	838.4	469.6	186.0	538.4	508.6	351.9	1329.3	552.3	392.3	530.6	130.3	151.0	497.0	1195.1	1700.5	825.8	637.3
Gizzard shad	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinook salmon	0.3	1.9	0.0	0.9	0.0	0.0	0.7	0.2	0.3	0.0	0.0	0.0	0.8	0.4	0.0	0.4	0.4
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Brown trout	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.1	0.1	0.5	0.0	0.1
Lake trout	66.5	82.5	97.3	76.0	57.7	24.7	15.7	3.4	3.3	6.3	3.0	3.8	2.5	2.3	1.1	4.0	28.1
Lake whitefish	20.5	42.6	34.6	27.1	15.1	8.4	15.9	1.4	4.8	10.7	6.8	2.9	6.1	1.4	0.7	3.4	12.7
Cisco (Lake herring)	6.9	3.7	7.1	2.6	0.7	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	1.3
Round whitefish	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coregonus sp.	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Rainbow smelt	3.5	0.5	0.5	1.7	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4
Northern pike	0.8	0.4	0.3	0.4	0.2	0.0	0.5	0.0	0.1	0.4	0.2	0.1	0.1	0.3	0.1	0.2	0.3
White sucker	5.6	6.0	0.5	1.8	0.0	0.9	4.8	0.3	1.5	1.1	1.0	1.8	2.2	1.3	0.8	0.5	1.9
Silver redhorse	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Greater redhorse	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Moxostoma sp.	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Common carp	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Brown bullhead	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.1	0.0	0.1	0.4	0.5	0.1	0.1	0.1	0.1
Channel catfish	1.0	0.1	0.0	0.2	0.0	1.0	0.5	0.5	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Stonecat	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.8	1.4	0.9	0.7	1.1	0.0	0.0	0.4
Burbot	0.1	0.4	0.2	0.7	0.9	1.6	1.4	0.3	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.4
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White perch	1.9	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.1	0.0	0.0	0.4
Rock bass	10.9	11.2	5.4	3.7	0.7	10.6	15.5	15.6	8.1	7.7	2.4	4.6	6.1	4.4	6.3	6.4	7.5
Pumpkinseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smallmouth bass	3.7	3.9	1.3	2.9	0.0	3.2	4.2	4.5	1.1	1.2	1.8	2.0	1.6	0.4	1.6	1.6	2.2
Yellow perch	319.0	306.6	96.2	60.7	58.2	97.7	147.0	118.4	117.8	46.8	112.5	103.9	298.5	127.5	250.7	164.7	151.6
Walleye	38.3	33.9	18.3	38.8	6.6	21.1	26.1	34.3	13.8	11.3	8.8	9.4	11.9	10.3	17.2	17.2	19.8
Round goby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	129.9	42.2	56.9	46.0	17.4
Freshwater drum	1.6	0.6	1.2	1.3	0.0	1.1	1.4	0.8	0.5	0.2	0.0	0.5	0.0	0.0	0.1	0.5	0.6
Total catch	1319	968	450	757	649	523	1564	734	545	618	268	286	959	1387	2037	1071	883
Number of species	19	21	14	16	10	13	16	18	16	16	12	19	17	16	14	14	31
Number of sets	86	88	40	30	29	29	29	41	48	60	60	60	60	60	60	60	840

TABLE 2.4.5. Species-specific catch per gillnet set in the **Kingston Basin** Lake Ontario (**deep sites**), 1992-2007. Shown are the average catches in 4-8 gillnet gangs set at a single depth (approx. 30 m) during each of 3 visits to each of 2 sites (EB02 and EB06). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Sea lamprey	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake sturgeon	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alewife	298.8	183.7	50.7	122.5	60.0	20.0	491.2	629.4	157.3	110.2	2.7	3.4	37.7	11.9	22.9	31.9	139.7
Chinook salmon	0.3	0.3	0.3	0.3	0.0	0.0	0.3	0.3	0.4	0.8	0.0	0.1	0.1	0.3	0.0	0.1	0.2
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Brown trout	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.1	0.0	0.3	0.1
Lake trout	276.6	244.5	207.5	166.9	147.8	78.9	51.3	41.4	22.7	10.4	10.1	11.8	12.1	8.1	13.0	15.5	82.4
Lake whitefish	51.5	71.3	28.8	37.8	26.6	33.4	24.4	16.4	6.2	2.7	2.7	1.1	8.9	1.0	1.9	1.9	19.8
Cisco (Lake herring)	1.9	0.5	2.2	0.8	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5
Rainbow smelt	12.9	4.4	5.5	4.9	1.6	0.3	2.7	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.1	2.1
American eel	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.3	0.5	0.3	0.8	1.1	0.8	0.3	1.1	0.8	0.3	0.1	0.1	0.0	0.0	0.0	0.4
Trout-perch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White perch	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Yellow perch	1.4	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.5	0.0	0.9	0.3	9.6	1.6	2.3	0.5	1.1
Walleye	0.0	0.0	0.5	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Round goby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	1.0	1.1	0.2
Freshwater drum	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slimy sculpin	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total catch	645	505	296	334	238	136	571	688	188	125	17	17	69	23	42	52	247
Number of species	10	8	8	10	6	10	8	6	7	6	6	7	10	8	7	9	18
Number of sets	24	24	24	24	24	24	24	24	36	24	24	48	48	48	48	48	516

in 2006 and 2007 than at any other time during 1992-2007. Round goby, first caught here in 2003, have not been caught since 2005.

Hay Bay

Twelve species were caught in Hay Bay gillnets in 2007. The most abundant species were yellow perch, white perch, alewife, walleye and white sucker (Table 2.4.7). Of these species, only white perch were more abundant in 2007 than the 1992-2007 average. Round goby, having been caught each year 2002-2005, were absent from the 2006 and 2007 catches.

Conway

Eighteen species were caught in Conway gillnets in 2007. The most abundant species were alewife, yellow perch, walleye, rock bass, alewife and white sucker (Table 2.4.8). Of these species, only rock bass abundance was higher in 2007 than the 1992-2007 average. Round goby, which were caught for the first time in 2002 and which had increased to a high abundance level by 2004, have subsequently declined to very low levels.

Species Highlights

Lake Whitefish

Fifty-one lake whitefish were caught in the 2007 index gillnets, up from 28 the year before. Forty five percent of these fish were age-4 from the 2003 year-class. These age-4 fish were an average of 322 mm fork length and 371 g in weight (Table 2.4.9 and Fig. 2.4.2). Female lake whitefish appear to mature at age-6. Lake whitefish condition appears to have stabilized at a level (e.g. 480 mm fish is approximately 3 lb) lower than that observed in the early 1990s but significantly higher than that in 1996 and 1997 (Fig. 2.4.3).

Walleye

The age distribution of walleye (Table 2.4.10) showed a broad range of age-classes from age-1 to age-21. Generally speaking, during the summer index gillnetting program young walleye were found in the Bay of Quinte (e.g., age-1 to age-5 fish comprised 91% of the Bay of Quinte walleye catch) while older walleye were present in eastern Lake Ontario (e.g., age-6 and older fish comprised 94% of the catches in the Kingston Basin). Of the young walleye, age-2 and age-4 walleye were common, age-1 and age-3 walleye were of moderate abundance, and age-5 fish were

TABLE 2.4.6. Species-specific catch per gillnet set at **Big Bay**, Bay of Quinte, 1992-2007. Shown are the average catches in 2-4 gillnet gangs set at a single depth (5 m) during each of 2-4 visits (summer). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Longnose gar	5.5	5.5	1.1	23.0	4.9	11.5	0.0	44.4	4.9	6.6	6.6	1.1	6.6	9.9	19.7	2.2	9.6
Alewife	1.1	1.1	0.0	0.0	4.9	26.3	8.2	0.0	1.6	0.0	5.8	11.0	20.8	0.0	4.9	0.0	5.4
Gizzard shad	4.4	108.6	30.7	162.8	3.3	0.0	8.2	162.8	3.3	14.0	43.6	13.2	1.1	277.4	1.6	6.6	52.6
Northern pike	8.8	7.7	7.7	0.0	3.3	1.6	1.6	3.3	4.9	0.8	0.8	0.0	1.1	1.1	3.3	1.1	2.9
Mooneye	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
White sucker	63.6	53.7	54.8	59.2	47.7	54.3	54.3	24.7	24.7	23.0	60.9	15.4	35.1	16.4	32.9	16.4	39.8
Moxostoma sp.	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.8	0.0	1.1	0.0	0.0	0.0	0.0	0.3
Common carp	3.3	1.1	6.6	0.0	0.0	6.6	3.3	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	1.4
Brown bullhead	36.2	100.0	57.0	21.4	19.7	31.3	54.3	70.7	42.8	44.4	36.2	12.1	15.4	5.5	13.2	5.5	35.3
Channel catfish	3.3	3.3	5.5	1.6	1.6	1.6	4.9	1.6	0.0	0.0	0.8	0.0	1.1	0.0	1.6	0.0	1.7
Burbot	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
White perch	1235.7	758.5	1537.3	360.2	225.3	305.9	438.6	404.6	302.6	144.7	239.3	393.6	858.6	523.0	1294.4	782.9	612.8
White bass	3.3	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	1.1	0.4
Rock bass	0.0	1.1	0.0	0.0	3.3	11.5	0.0	0.0	3.3	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.3
Pumpkinseed	0.0	6.6	0.0	1.6	13.2	21.4	121.7	37.8	82.2	111.8	54.3	5.5	28.5	2.2	21.4	3.3	32.0
Bluegill	0.0	0.0	0.0	0.0	1.6	6.6	16.4	8.2	11.5	46.9	24.7	3.3	2.2	16.4	42.8	35.1	13.5
Smallmouth bass	0.0	2.2	0.0	0.0	8.2	49.3	18.1	3.3	4.9	3.3	0.0	0.0	0.0	0.0	3.3	0.0	5.8
Largemouth bass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.2
Black crappie	2.2	1.1	0.0	0.0	0.0	0.0	4.9	0.0	0.0	1.6	2.5	2.2	1.1	1.1	14.8	6.6	2.4
Yellow perch	118.4	380.0	62.5	350.3	1129.9	1432.6	1776.6	842.1	1044.4	1254.1	1203.1	758.8	721.5	677.6	782.9	108.6	790.2
Walleye	237.9	142.1	122.8	115.1	111.8	85.5	87.2	60.9	49.3	29.6	50.2	42.8	52.6	38.4	70.7	35.1	83.3
Round goby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	3.3	0.0	0.0	0.5
Freshwater drum	85.5	30.7	85.5	75.7	139.8	120.1	75.7	70.7	90.5	139.8	48.5	48.2	48.2	62.5	129.9	74.6	82.9
Total catch	1809	1605	1971	1173	1719	2173	2674	1737	1671	1822	1778	1311	1797	1636	2439	1079	1775
Number of species	14	17	11	11	15	17	15	14	14	14	15	15	16	14	16	13	23
Number of sets	6	6	6	4	4	4	4	4	4	8	8	6	6	6	4	6	86

TABLE 2.4.7. Species-specific catch per gillnet set at **Hay Bay**, Bay of Quinte, 1992-2007. Shown are the average catches in 1-3 gillnet gangs set at each of 2 depths (7.5 and 12.5 m) during each of 1-2 visits (summer). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	119.5	42.8	52.1	117.6	31.3	48.5	17.3	20.6	28.8	126.6	53.5	0.0	8.2	1.6	49.3	24.7	46.4
Gizzard shad	2.2	13.2	0.5	0.8	0.0	4.9	0.8	6.6	8.2	0.0	1.6	0.0	0.0	0.0	3.3	0.8	2.7
Chinook salmon	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Brown trout	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake trout	3.8	0.0	0.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.5
Lake whitefish	2.2	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Cisco (Lake herring)	1.6	19.7	3.3	5.8	37.8	85.5	83.9	1.6	12.3	6.6	0.8	0.0	0.8	0.0	0.0	0.8	16.3
Coregonus sp.	0.0	0.0	0.0	0.8	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Rainbow smelt	2.2	0.0	4.9	2.5	0.0	0.8	0.8	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.8	0.0	0.9
Northern pike	3.8	3.3	15.9	5.8	7.4	3.3	2.5	3.3	4.1	5.8	0.8	2.5	0.0	3.3	2.5	7.4	4.5
White sucker	46.6	32.9	40.6	55.9	45.2	71.5	30.4	26.3	18.1	37.0	18.9	14.8	40.3	9.9	11.5	9.0	31.8
Common carp	1.6	16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Spottail shiner	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1
Brown bullhead	1.1	16.4	4.9	10.7	0.0	0.8	10.7	5.8	5.8	5.8	0.8	1.6	1.6	2.5	5.8	2.5	4.8
Channel catfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.2
Burbot	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
White perch	25.8	118.4	48.8	182.6	27.1	41.1	25.5	175.2	19.7	3.3	35.4	55.1	95.4	0.8	198.2	106.9	72.5
Rock bass	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Pumpkinseed	0.0	0.0	0.0	0.8	0.0	1.6	18.9	51.8	1.6	7.4	6.6	4.1	14.0	2.5	4.1	4.9	7.4
Smallmouth bass	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.6	0.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.3
Yellow perch	1247.3	1144.7	808.8	1246.7	596.2	1150.5	884.0	1433.4	847.0	948.2	737.7	727.0	565.8	939.1	421.1	671.1	898.0
Walleye	15.9	52.6	7.7	26.3	18.9	30.4	32.1	43.6	9.9	16.4	24.7	18.1	14.0	5.8	11.5	16.4	21.5
Round goby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6	0.8	0.0	0.0	0.4
Freshwater drum	1.6	13.2	0.5	8.2	4.1	6.6	8.2	11.5	9.9	1.6	20.6	8.2	43.6	16.4	54.3	6.6	13.4
Total catch	1476	1477	989	1666	771	1449	1117	1782	967	1160	905	836	786	983	762	852	1124
Number of species	16	12	13	15	9	14	14	13	13	12	14	11	11	10	11	12	24
Number of sets	12	2	12	8	8	8	8	8	8	8	8	8	8	8	8	8	130

uncommon. Older walleye, from many strong year-classes, were also abundant in eastern Lake Ontario. Female walleye first mature during the summer at age-4 to presumably spawn the following spring at age-5.

Round Goby

Only large round goby are susceptible to capture in assessment gillnets. Fish between about 130 and 150 (average 139 mm) are readily caught in the smallest gillnet mesh size (38 mm mesh; Fig. 2.4.4). Round goby first appeared in assessment gillnets in the northeast and Bay of Quinte in 2002, Kingston Basin nearshore sites in 2003 (depth range 7.5 to 27.5 m), and in Kingston Basin deep sites (depth about 30 m) in 2004 (Table 2.4.11). No round goby were captured to date at Middle Ground or the Rocky Point deep sites (40-140 m). In the Bay of Quinte, round goby abundance initially increased, peaked in 2004, and then decreased substantially over the next three years. In Lake Ontario, goby abundance continues to increase.

Lake Trout

The abundance of lake trout remains low (Fig. 2.4.5). The current levels were reached around the year 2002, after a period of decline that began in the early 1990s, and which was attributed in large part to poor early survival of the stocked fish. The early survival remains low (Fig. 2.4.6); and even though some improvement in survival to age-3 was observed in 2007, it is too early to comment on the significance of this observation.

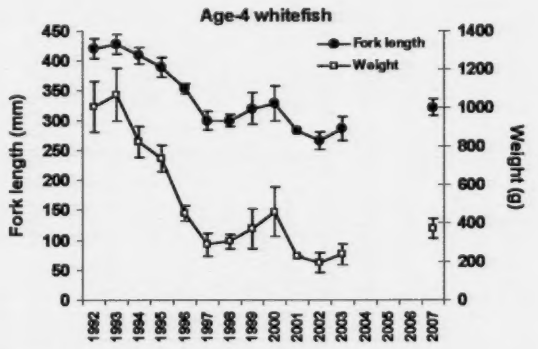

FIG. 2.4.2. Lake whitefish fork length and weight of an age-4 fish caught in summer index gillnets, 1992-2007. No age-4 fish were caught between 2004 and 2006.

TABLE 2.4.8. Species-specific catch per gillnet set at **Conway**, Bay of Quinte, 1993-2007. Shown are the average catches in 1-2 gillnet gangs set at each of 5 depths (range 5-40 m) during each of 2 visits (summer). The total number of species caught and gillnets set each year are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Sea lamprey		0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake sturgeon		0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose gar		0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alewife		422.8	659.7	370.6	132.8	268.2	193.3	5.2	76.0	54.3	19.1	39.5	106.6	456.9	76.0	127.3	200.6
Gizzard shad		0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.3	0.2
Chinook salmon		1.1	0.0	0.0	0.0	0.0	0.7	0.3	0.0	0.3	0.0	0.3	0.7	0.0	0.0	0.7	0.3
Rainbow trout		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Atlantic salmon		0.0	0.4	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brown trout		8.2	2.6	3.3	0.0	0.9	0.4	0.3	0.0	0.7	0.3	2.3	0.7	1.6	1.6	1.0	1.6
Lake trout		15.4	13.9	8.2	25.5	20.7	8.4	1.0	8.6	4.9	15.1	11.5	13.5	18.1	7.6	8.9	12.1
Lake whitefish		11.5	5.1	0.0	10.7	4.8	12.1	3.5	2.0	3.0	1.6	4.9	0.7	3.9	2.0	1.6	4.5
Cisco (Lake herring)		4.9	0.7	0.0	0.0	0.2	1.5	0.7	2.3	1.3	0.0	0.0	0.0	0.0	0.3	0.0	0.8
Coregonus sp.		0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Rainbow smelt		1.1	0.0	0.0	0.0	0.4	2.6	1.7	0.0	1.3	0.0	0.0	0.3	1.3	0.3	0.0	0.6
Northern pike		1.1	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.3	0.2
White sucker		19.2	16.4	15.1	11.1	8.1	8.8	22.5	23.0	21.7	17.1	14.1	6.9	3.9	3.0	9.5	13.4
Silver sedhorse		0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Moxostoma sp.		0.5	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Common carp		1.1	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Brown bullhead		1.6	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.7	1.3	1.0	5.9	2.3	0.9
Channel catfish		0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.3	0.0	0.0	0.1
Stonecat		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Burbot		0.0	0.0	0.0	0.0	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Trout-perch		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White perch		70.3	6.9	19.7	0.4	1.1	0.0	5.9	0.3	0.0	0.3	5.6	17.4	0.0	5.6	8.2	9.5
Rock bass		42.8	8.8	16.4	5.8	8.3	18.6	18.0	7.2	3.0	5.9	1.0	1.0	3.3	6.3	25.3	11.4
Pumpkinseed		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.2
Smallmouth bass		4.4	1.1	1.6	1.6	1.3	1.8	5.9	1.6	0.3	0.0	0.0	0.0	0.3	1.0	1.0	1.5
Yellow perch		1219.2	466.0	546.1	377.5	264.3	324.2	682.1	656.2	430.9	509.9	320.1	218.1	184.2	376.6	119.7	446.3
Walleye		133.9	62.9	99.0	67.8	19.1	18.6	17.0	25.3	6.6	9.5	17.8	6.9	8.2	12.5	16.4	34.8
Round goby		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	72.4	204.3	5.3	1.0	0.7	19.3
Freshwater drum		9.9	2.9	4.4	1.2	4.8	1.1	1.7	3.3	0.3	0.7	1.0	4.3	3.3	7.9	8.9	3.7
Total catch		1970	1249	1085	634	604	594	767	808	531	587	492	583	692	508	334	763
Number of species		19	17	11	10	20	17	16	13	19	14	15	16	15	15	18	32
Number of sets	0	12	18	12	16	30	30	30	20	20	20	20	20	20	20	20	308

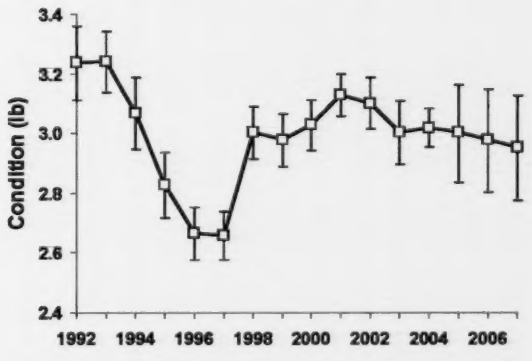

FIG. 2.4.3. Lake whitefish condition (lb) standardized for a fish of length 21 inches (480 mm fork length) caught in summer index gillnets, 1992-2007. Only fish >=age-5 years were included in the analysis.

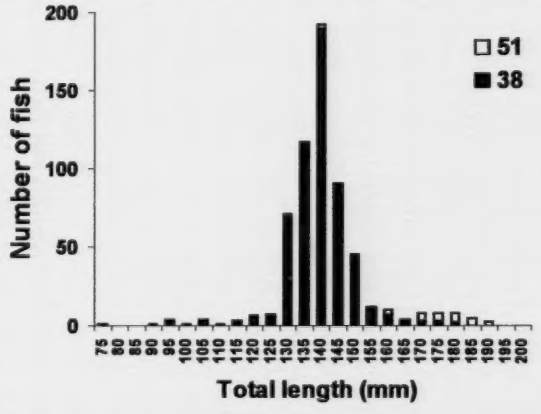

FIG. 2.4.4. Round goby size distribution for fish caught in 38 mm and 51 mm gillent mesh, 2007. Only 1 of 602 round goby was caught in a larger mesh size.

TABLE 2.4.9. Age distribution of 51 lake whitefish sampled from summer index gillnets, by region, 2007. Also shown are mean fork length, mean weight, mean GSI (females), and percent mature (females). GSI = gonadal somatic index calculated for females only as log10(gonad weight + 1)/log10(weight). A GSI greater than approximately 0.25 indicates a mature female.

	Age (years) / Year class																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	
Bay of Quinte	0	1	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
Kingston Basin (nearshore)	0	1	6	17	0	1	0	1	1	0	0	0	1	0	0	3	0	0	0	0	0	0	31
Kingston Basin (offshore)	2	0	2	4	2	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	14
Northeast	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	2	8	23	2	1	1	3	2	0	0	1	1	1	0	4	0	0	0	0	0	0	51
Mean fork length (mm)	181	209	286	322	388	442	427	422	435			514	487	487		505							
Mean weight (g)	56	88	260	371	590	1127	1070	893	941			1682	1391	1474		1635							
GSI (females)			0.05	0.13	0.18	0.52		0.50								0.56							
% Mature (females)			0%	0%	0%	100%		100%								100%							

TABLE 2.4.10. Age distribution of 304 walleye sampled from summer index gillnets, by region, 2007. Also shown are mean fork length, mean weight, mean GSI (females), and percent mature (females). GSI = gonadal somatic index calculated for females only as log10(gonad weight + 1)/log10(weight).

	Age (years) / year-class																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	
Bay of Quinte	7	44	9	31	1	2	0	2	0	1	0	0	1	1	0	0	1	1	0	0	0	101
Kingston Basin (nearshore)	0	0	1	8	1	20	5	18	6	10	3	4	13	12	9	17	10	4	6	7	1	155
Middle Ground	0	10	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
Northeast	0	7	2	6	0	1	1	3	3	1	0	0	4	0	2	0	1	1	0	1	1	34
Total	7	61	13	46	4	23	6	23	9	12	3	4	18	13	11	17	12	6	6	8	2	304
Mean fork length (mm)	228	353	417	465	442	561	591	584	613	623	643	650	659	634	619	655	649	656	628	648	662	
Mean weight (g)	131	489	891	1217	1435	2363	2753	2685	3161	2996	3344	3787	3846	3307	3196	3502	3441	3691	3065	3477	3590	
GSI (females)		0.14	0.23	0.31	0.35	0.33	0.41	0.39	0.40	0.40	0.47	0.45	0.44	0.42	0.35	0.48	0.44	0.49	0.33	0.56	0.65	
% mature (females)		0%	33%	90%	100%	76%	100%	90%	100%	86%	100%	100%	100%	88%	100%	100%	80%	100%	100%	100%	100%	

TABLE 2.4.11. Round goby catch-per-gillnet, by region, in eastern Lake Ontario and the Bay of Quinte, 1992-2007.

	Region									
	Middle Ground	Northeast	Rocky Point (deep sites)	Kingston Basin (nearshore sites)	Kingston Basin (deep sites)	Big Bay	Hay Bay	Conway	Lake Ontario	Bay of Quinte
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	0.00	0.00	0.00	0.00	1.64	6.58	0.00	2.74
2003	0.00	0.78	0.00	2.90	0.00	2.19	1.64	72.37	0.73	25.40
2004	0.00	1.81	0.00	129.90	0.41	2.19	1.64	204.28	26.42	69.37
2005	0.00	50.94	0.00	42.25	0.27	3.29	0.82	5.26	18.69	3.13
2006	0.00	63.26	n/a	56.89	0.96	0.00	0.00	0.99	30.28	0.33
2007	0.00	162.09	n/a	46.02	1.14	0.00	0.00	0.66	52.31	0.22

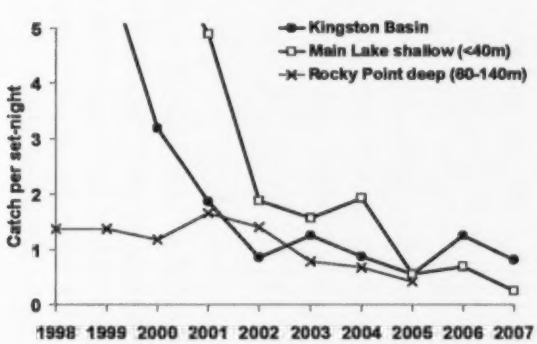

FIG. 2.4.5. Catch per unit effort of adult lake trout in bottom-set gillnets in three areas of eastern lake Ontario. Deep sets off Rocky Point were not fished in 2006 and 2007.

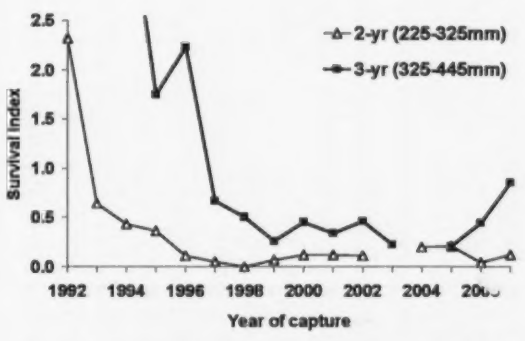

FIG. 2.4.6. Relative survival to ages 2 and 3. The survival index is the catch per unit effort of 2 and 3 year old fish, corrected for number stocked 2 or 3 years earlier; age determination is based on length-frequency data.

2.5 Eastern Lake Ontario and Bay of Quinte Fish Community Index Trawling

Bottom trawling was carried out during 2007 to monitor the abundance of small fish species and the young (e.g. age-0) of larger species. Bottom trawling at fixed sites (Fig. 2.5.1) in eastern Lake Ontario (ranging in depth from 21-100 m) and the Bay of Quinte (ranging in depth from 4 to 23 m) has occurred annually since 1972 (except 1989). Typically, ½ mile trawl drags using a three-quarter "Yankee Standard" No. 35 bottom trawl are made at Lake Ontario sites while ¼ mile drags using a three-quarter "Western" bottom trawl are made at Bay of Quinte sites. At the deep Rocky Point trawl site (100 m) the trawling distance is 1 mile. Species-specific catches in the 2007 trawling program are shown in Tables 2.5.1-2.5.10. Twenty-eight species and over 75,000 fish were caught in 92 bottom trawls in 2007. Yellow perch (29%), round goby (22%), alewife (19%), freshwater drum (11%) and white perch (10%) collectively made up over 90% of the catch. Trawl survey results are summarized by geographic areas (Fig. 2.5.1) and then by species of interest.

Lake Ontario Sites

EB02

Trawl catches were very low at EB02 in 2007; only five species, round goby, alewife, rainbow smelt, lake trout and lake whitefish, were caught (Table 2.5.1).

EB03

Eight species were caught at EB03 in 2007. The most abundant species were round goby, alewife and

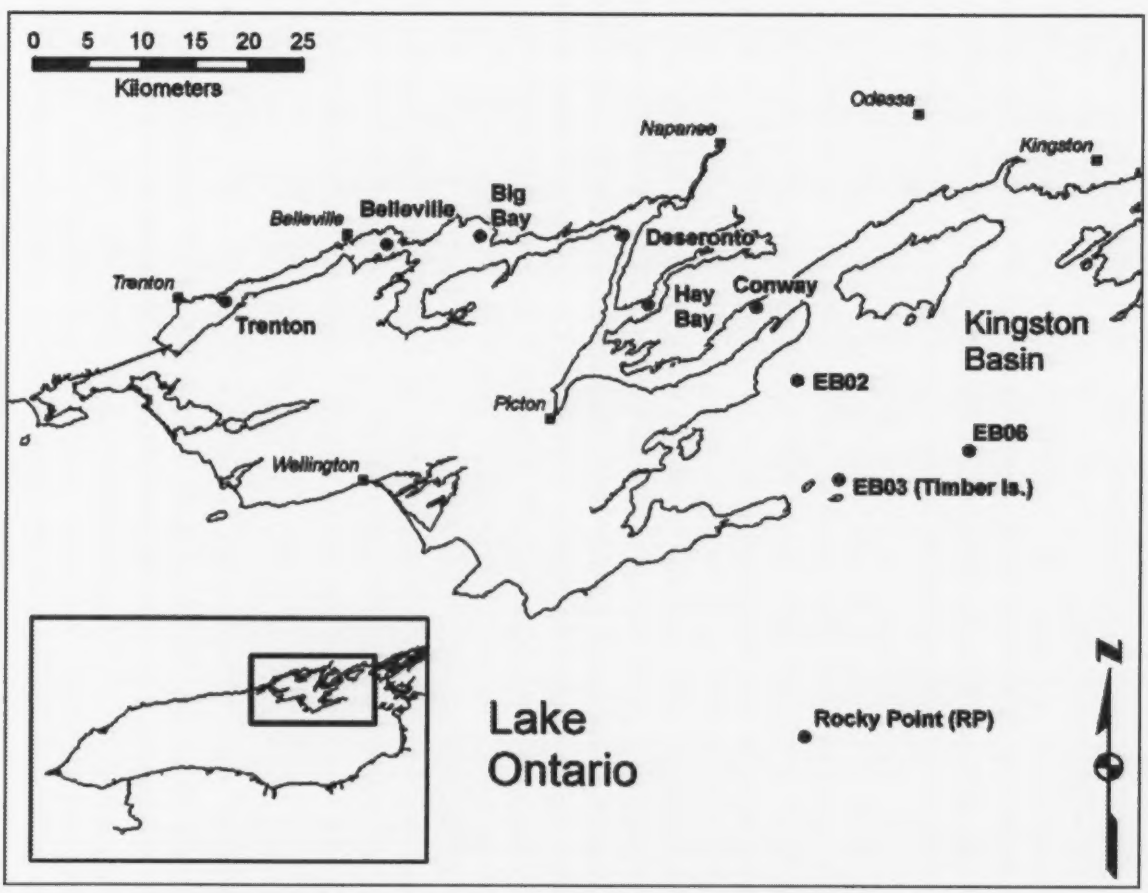

FIG. 2.5.1. Map of northeastern Lake Ontario. Shown are eastern Lake Ontario and Bay of Quinte fish community index bottom trawling site locations.

TABLE 2.5.1. Species-specific catch per trawl (12 min duration; 1/2 mile) by year in the fish community index bottom trawling program during summer at **EB02**, eastern Lake Ontario. Catches are the mean number of fish observed for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	4405.278	150.553	288.789	226.167	45.083	77.167	576.333	60.667	5152.700	203.333	20.917	19.500	27.100	0.000	0.455	11.000	704.07
Gizzard shad	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Rainbow trout	0.000	0.000	0.000	0.000	0.000	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.01
Lake trout	0.278	0.765	0.278	0.417	0.000	0.000	0.000	0.000	0.083	0.000	0.083	0.083	0.000	0.700	0.182	0.583	0.22
Lake whitefish	4.056	1.353	3.167	6.083	7.083	5.167	1.500	0.250	0.167	0.167	0.000	0.583	0.400	0.300	0.000	0.167	1.90
Cisco (Lake herring)	0.778	0.176	2.056	0.167	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.20
Coregonus sp.	0.000	0.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Rainbow smelt	1244.817	593.971	397.306	1047.750	352.383	283.417	14.417	4.417	29.583	29.667	7.917	0.917	5.000	23.700	31.364	3.583	254.39
White sucker	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Common carp	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Emerald shiner	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.01
Spottail shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
American eel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Burbot	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.01
Brook stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Threespine stickleback	0.056	0.000	0.000	0.083	0.750	4.583	14.500	25.167	75.417	18.750	34.417	49.500	6.200	10.800	0.182	0.000	15.03
Trout-perch	0.278	0.882	5.167	1.833	6.000	1.250	25.333	0.583	0.750	0.250	0.000	0.167	0.000	0.000	0.000	0.000	2.66
White perch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Smallmouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Yellow perch	0.111	0.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.700	0.400	0.091	0.000	0.08
Walleye	0.056	0.059	0.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.03
Johnny darter	0.056	0.000	0.556	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.07
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	250.100	29.800	43.727	119.750	27.72
Freshwater drum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Sculpin sp.	0.167	0.000	0.167	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.03
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Slimy sculpin	1.889	1.529	3.833	0.167	2.500	1.417	1.333	4.083	2.000	0.417	0.667	44.083	74.900	0.900	0.182	0.000	8.74
Deepwater sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Total	5657.8	749.3	701.8	1282.7	414.1	373.3	633.4	95.3	5260.7	252.6	64.0	114.9	364.8	66.6	76.2	135.1	1015.2
Number of species	11	8	10	8	8	8	6	7	7	6	5	8	8	7	7	5	15
Number of trawls	18	17	18	12	12	12	12	12	12	12	12	12	10	10	11	12	204

TABLE 2.5.2. Species-specific catch per trawl (12 min duration; 1/2 mile) by year in the fish community index bottom trawling program during summer at **EB03**, eastern Lake Ontario. Catches are the mean number of fish observed for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	2366.830	420.308	924.583	875.750	446.500	313.338	284.000	0.000	721.425	57.375	21.375	8.000	168.375	16.182	15.250	33.917	287.092
Gizzard shad	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.017
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.727	0.000	0.000	0.057
Rainbow trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	1.083	0.083	4.583	1.375	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.453
Lake whitefish	0.917	4.750	89.417	20.250	3.750	10.625	0.000	0.000	0.000	0.000	0.000	43.938	2.333	54.545	3.000	1.417	15.602
Cisco (Lake herring)	0.000	0.333	1.667	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	59.000	20.333	927.450	1646.125	170.250	1729.200	98.125	0.875	5.125	20.000	207.488	109.231	1.917	28.000	20.625	21.500	333.750
White sucker	0.833	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.006
Common carp	0.917	0.167	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	354.917	22.917	3.833	0.000	0.000	0.125	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.808
American eel	0.000	0.000	0.250	0.000	0.125	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brook stickleback	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
Threespine stickleback	33.000	0.083	0.583	0.000	3.750	144.000	0.875	37.000	76.750	67.375	680.138	459.275	2781.625	126.636	8.500	0.000	292.439
Trout-perch	1663.200	938.017	2072.667	120.375	106.250	190.875	57.375	3.125	1049.800	175.000	592.200	56.294	255.083	3.727	3.750	0.417	374.997
White perch	0.000	0.083	0.083	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019
Smallmouth bass	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Yellow perch	0.583	0.167	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.083	0.000	0.500	0.167	0.108
Walleye	1.250	0.750	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.125	0.000	0.071
Johnny darter	4.667	0.500	2.083	0.000	0.250	0.125	0.000	0.000	0.250	0.000	0.000	9.875	32.833	0.182	0.000	0.000	3.073
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	798.936	850.325	910.133	170.649
Freshwater drum	0.250	0.083	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.125	0.000	0.025
Sculpin sp.	0.000	0.000	0.000	0.000	1.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.117
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.688	0.000	0.000	0.000	0.000	0.046
Slimy sculpin	0.833	0.083	1.417	0.125	0.125	0.625	0.000	0.000	0.125	0.000	0.250	6.750	10.833	0.091	0.000	0.000	1.362
Deepwater sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	4488.3	1408.7	4029.0	2664.6	733.4	2389.0	440.4	41.0	1854.1	319.8	1501.5	694.7	3253.5	1029.0	902.2	968.1	1481.9
Number of species	14	15	16	7	10	9	4	3	10	4	5	10	10	9	9	9	23
Number of trawls	12	12	12	8	8	8	8	8	8	8	8	16	12	11	8	12	159

TABLE 2.5.3. Species-specific catch per trawl (12 min duration; 1/2 mile) by year in the fish community index bottom trawling program during summer at EB06, eastern Lake Ontario. Catches are the mean number of fish observed for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife	540.442	84.308	42.250	46.417	16.333	0.000	16.000	27.091	0.000	6.700	0.250	0.083	1.250	0.417	9.600	0.917	49.504
Gizzard shad	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	2.167	0.917	1.000	0.750	0.333	0.167	0.083	0.000	0.083	0.100	0.083	0.083	0.083	0.000	0.000	0.000	0.366
Lake whitefish	0.917	24.667	3.250	8.333	3.000	0.000	0.583	0.091	0.083	0.000	0.167	0.167	0.250	0.000	0.000	0.083	2.599
Cisco (Lake herring)	0.083	0.000	0.000	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	1294.233	697.400	383.167	2457.500	661.750	264.667	471.750	378.164	115.917	25.700	6.750	0.250	25.083	142.583	28.700	0.583	434.637
White sucker	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
American eel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brook stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.083	0.250	64.909	9.667	3.100	47.750	11.417	7.500	13.917	1.300	0.000	9.993
Trout-perch	0.250	0.917	1.917	3.667	0.667	0.750	0.667	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.557
White perch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Smallmouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Yellow perch	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
Walleye	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Johnny darter	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.000	0.021
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.000	82.925	5.558
Freshwater drum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sculpin sp.	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.083	0.000	0.000	0.583	0.000	0.091	0.000	0.100	0.000	3.583	399.158	15.750	0.300	0.000	26.228
Deepwater sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	1838.3	808.2	431.7	2516.8	682.1	266.3	489.3	470.3	125.9	35.7	55.0	15.6	433.7	172.7	45.9	84.5	529.5
Number of species	8	5	6	6	5	5	6	5	6	5	5	6	7	4	5	4	12
Number of trawls	12	12	12	12	12	12	12	11	12	10	12	12	12	12	10	12	187

rainbow smelt. The abundance of these species was similar to that of the previous year. Round goby, having first appeared in the EB03 catches in 2004, now dominates the total catch (Table 2.5.2).

EB06

Trawl catches at EB06 were very low in 2007; only four species, round goby, alewife, rainbow smelt and lake whitefish, were caught (Table 2.5.3). This was only the second year that round goby were caught at EB06 but goby now dominate the catch.

Rocky Point

Four species were caught at the deep (100 m) Rocky Point site, slimy sculpin, alewife, rainbow smelt and deepwater sculpin (Table 2.5.4). This is the only Lake Ontario trawl site where sculpin were caught and round goby were not caught in 2007. Deepwater sculpin appear to be increasing at this site.

Bay of Quinte Sites

Trenton

Fifteen species were caught at Trenton in 2007. The most abundant species were yellow perch, pumpkinseed, white perch, alewife, and freshwater drum (Table 2.5.5). Round goby have decreased significantly in abundance since peaking in 2005.

Belleville

Eighteen species were caught at Belleville in 2007. Freshwater drum, white perch, yellow perch, gizzard shad and round goby were the most abundant species in the catch at Belleville, 2007 (Table 2.5.6).

TABLE 2.5.4. Species-specific catch per trawl (12 min duration; 1/2 mile) by year in the fish community index bottom trawling program during summer at **Rocky Point**, eastern Lake Ontario. Catches are the mean number of fish observed for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Alewife						11.000	5.250	0.000	0.250	5.500	0.750	3.000	11.500	0.250		13.750	5.1
Gizzard shad						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Chinook salmon						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Rainbow trout						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Lake trout						0.000	0.000	0.000	0.500	1.000	0.000	0.000	0.250	0.000		0.000	0.2
Lake whitefish						0.000	0.000	0.000	0.750	0.000	0.250	0.000	0.000	0.000		0.000	0.1
Cisco (Lake herring)						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Coregonus sp.						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Rainbow smelt						378.000	844.250	161.250	220.500	159.500	75.250	8.250	22.750	11.000		4.500	188.5
White sucker						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Common carp						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Emerald shiner						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Spottail shiner						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
American eel						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Burbot						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Brook stickleback						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Threespine stickleback						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250		0.000	0.1
Trout-perch						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
White perch						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Smallmouth bass						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Yellow perch						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Walleye						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Johnny darter						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Round goby						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Freshwater drum						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Sculpin sp.						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Mottled sculpin						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.0
Slimy sculpin						16.000	16.000	7.250	5.750	0.500	0.250	4.500	191.500	28.500		49.500	32.0
Deepwater sculpin						0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250		1.500	0.2
Total						405.0	865.5	168.5	227.8	166.5	76.5	15.8	226.3	40.3		69.3	226.1
Number of species						3	3	2	5	4	4	3	5	5		4	7
Number of trawls	0	0	0	0	0	5	4	4	4	2	4	4	4	4	0	4	39

Big Bay

Eighteen species were caught at Big Bay in 2007. The most abundant species were white perch, freshwater drum, round goby, and yellow perch (Table 2.5.7).

Deseronto

Sixteen species were caught at Deseronto in 2007. The most abundant species were white perch, yellow perch and alewife (Table 2.5.8).

Hay Bay

Seventeen species were caught at Hay Bay in 2007. The most abundant species were yellow perch, alewife and spottail shiner (Table 2.5.9).

Conway

Nine species were caught at Conway in 2007. The most abundant species were round goby, rainbow smelt and yellow perch (Table 2.5.10). For the last two years, lake herring catches were higher than at any point since 1994.

Species Highlights

Catches of age-0 fish in 2007 for selected species and locations are shown in Tables 2.5.11-2.5.14 for lake whitefish, lake herring, yellow perch and walleye respectively. Age-0 lake whitefish catches were very low at both Conway and Timber Island in 2007 (Table 2.5.11). Age-0 lake herring catches at Conway were moderate in 2007 and have been moderate to high in four of the last five years (Table 2.5.12). Age-0 catches of yellow perch were very high (Table 2.5.13) while walleye were higher than the previous three years (Table 2.5.14).

Age-0, age-1, age-2 and age-4 walleye were common while age-3 and age-5 walleye were uncommon (Table 2.5.15).

TABLE 2.5.5. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Trenton** (4 m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sea lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Longnose gar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alewife	34.250	154.075	12.250	109.125	13.875	5.750	1.125	246.075	25.625	149.288	98.600	174.113	8.625	508.825	126.625	24.500	105.795
Gizzard shad	29.625	54.000	691.450	369.750	23.875	114.400	4.125	131.750	68.438	4.125	6.375	22.250	0.000	30.375	23.375	1.375	98.455
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake whitefish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cisco (Lake herring)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	0.000	0.000	0.125	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
Northern pike	0.000	0.000	0.250	0.125	0.000	0.125	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.047
Mooneye	0.375	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
White sucker	11.000	6.000	1.875	3.375	1.875	0.625	0.375	1.875	0.000	0.500	1.625	0.625	1.125	1.875	2.125	2.125	2.313
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Minnow	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	1.250	1.000	0.000	0.000	0.000	0.000	0.125	0.125	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.188
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	19.250	54.125	206.825	188.750	55.000	163.750	3.750	104.500	0.250	217.400	60.875	60.875	1.250	24.500	41.750	0.000	75.178
Brown bullhead	15.750	22.375	20.000	20.375	24.875	60.875	9.375	61.250	3.000	10.625	3.500	4.250	1.125	8.750	3.750	4.500	17.148
Channel catfish	0.000	0.625	0.000	0.000	0.125	1.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
American eel	0.125	0.250	1.375	0.125	0.250	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.141
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trout-perch	23.875	44.875	79.375	43.250	28.875	21.250	2.250	0.500	0.000	0.500	0.500	0.000	0.000	0.125	0.125	0.000	15.344
White perch	16.125	38.125	601.725	304.500	322.325	1457.650	21.375	126.250	1.500	54.250	19.875	240.000	80.775	278.988	388.213	29.875	248.847
White bass	0.125	0.250	0.750	0.750	0.375	1.250	0.000	0.125	0.000	0.000	0.125	0.000	0.000	0.000	1.250	0.125	0.320
Sunfish	0.000	3.875	0.750	93.375	0.000	0.000	0.750	25.125	0.000	33.250	0.000	22.375	0.000	0.000	11.500	0.000	11.938
Rock bass	0.000	0.000	0.625	0.500	2.500	0.125	0.125	0.000	4.125	0.625	0.625	0.125	0.000	0.500	2.250	0.000	0.758
Pumpkinseed	4.500	24.000	15.875	21.000	79.375	90.375	55.875	113.250	372.850	84.750	32.250	88.875	56.788	46.750	20.000	77.513	74.002
Bluegill	0.000	0.125	0.250	0.375	1.375	0.000	0.000	0.375	4.250	1.125	0.500	1.500	0.875	0.375	3.875	5.250	1.266
Smallmouth bass	0.000	0.375	0.000	0.000	0.625	2.000	0.250	0.250	1.500	0.375	0.250	0.500	0.500	0.125	0.000	0.000	0.422
Largemouth bass	0.000	0.000	0.000	4.375	1.000	7.750	0.625	5.375	1.000	2.375	2.875	4.625	0.125	6.625	4.250	0.125	2.570
Black crappie	0.250	1.750	9.000	2.875	1.000	0.250	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.953
Lepomis sp.	0.000	0.000	6.875	0.000	0.000	0.000	0.000	0.000	0.000	0.000	64.788	0.000	0.000	59.750	10.250	0.000	8.854
Yellow perch	63.000	293.838	526.525	960.625	122.613	523.263	33.375	101.625	234.800	200.625	239.000	544.613	186.375	340.825	130.125	584.738	317.873
Walleye	10.000	17.875	23.750	20.250	8.500	5.375	0.500	1.625	0.000	9.625	3.625	10.500	1.500	1.875	0.750	4.750	7.531
Johnny darter	0.000	1.375	1.250	34.750	8.625	2.625	0.375	0.125	0.000	2.500	7.250	7.625	0.375	0.000	0.000	0.000	4.180
Logperch	0.250	0.625	0.375	3.875	5.500	8.125	8.375	0.125	0.625	2.000	0.000	15.250	4.250	52.750	0.625	5.625	6.773
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.125	0.023
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.875	8.500	13.125	5.250	0.750	1.906
Freshwater drum	1.625	22.750	12.125	46.625	9.375	3.875	5.125	5.375	0.500	6.750	3.625	2.000	0.375	4.125	4.875	9.500	8.664
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	231.5	742.4	2213.4	2228.8	711.9	2470.8	148.3	925.8	718.6	780.9	546.5	1203.2	352.6	1380.4	781.2	750.9	1011.7
Number of species	18	22	21	21	21	20	19	20	14	20	18	19	15	18	19	15	30
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	128

Site-specific round goby catches are summarized in Table 2.5.16. Round goby first appeared in bottom trawl catches in the Bay of Quinte in 2001 and in the Kingston Basin of eastern Lake Ontario in 2003. The species was caught at all Bay of Quinte trawling sites by 2003, peaking in abundance, at each site, between 2003 and 2005. Catches declined precipitously in 2006 but rebounded in 2007. Round goby appear to be still increasing in the Kingston Basin where they now dominate catches. Bottom trawl catches indicate that round goby now are distributed throughout the Bay of Quinte and the Kingston Basin. Round goby from 30-90 mm total length (mean = 61 mm) were commonly taken in bottom trawls (Fig. 2.5.2).

Six deepwater sculpin were caught at the Rocky Point deep water site (100 m) in 2007. Five of the fish were relatively small, ranging from 83-95 mm total length and from 4.5-8.5 g in weight. The other deepwater sculpin was 125 mm and weighted 21.4 g (Table 2.5.17.

ABLE 2.5.6. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Belleville** (5 m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sea lamprey	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Longnose gar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alewife	45.125	501.913	2.250	198.750	31.625	0.125	23.750	11.250	13.375	0.250	82.375	0.125	11.500	13.875	9.750	0.125	59.135
Gizzard shad	6.125	11.625	31.250	163.250	0.250	77.238	81.125	245.875	1762.000	99.200	234.363	46.025	581.775	50.563	88.325	73.313	222.019
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake whitefish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cisco (Lake herring)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063
Northern pike	0.250	0.250	0.125	0.125	0.125	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063
Mooneye	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
White sucker	3.000	1.000	11.250	1.250	3.375	2.125	0.375	0.750	0.500	0.375	0.375	0.500	0.125	0.000	0.750	0.250	1.625
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Minnow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	0.500	0.125	1.125	0.375	0.250	0.000	0.000	0.500	0.000	0.125	0.125	0.625	0.000	0.500	0.625	0.250	0.320
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	32.000	160.625	115.125	123.250	49.375	21.500	15.875	103.125	19.375	10.625	21.500	4.750	3.875	13.250	23.875	3.750	45.117
Brown bullhead	27.625	10.750	36.125	9.875	8.625	9.375	10.750	25.000	22.500	32.000	10.875	5.375	17.875	15.000	14.875	9.375	16.625
Channel catfish	0.000	0.000	0.250	0.000	0.250	0.000	0.125	0.000	0.000	0.000	0.125	0.125	0.000	0.375	0.000	0.000	0.078
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
American eel	0.375	0.375	0.750	0.125	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.109
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trout-perch	179.875	53.500	302.000	6.000	118.500	24.875	2.000	1.125	13.625	13.000	5.500	12.750	14.375	9.750	4.000	14.250	48.445
White perch	34.250	149.500	122.000	496.375	714.338	658.600	44.500	251.000	205.013	6.625	154.625	165.013	1929.950	475.900	880.563	338.925	414.198
White bass	0.250	0.250	0.125	1.250	0.750	8.250	0.250	0.375	0.000	0.125	3.000	1.625	3.625	2.000	6.000	0.250	1.758
Sunfish	0.000	0.000	0.250	0.000	0.000	0.000	21.875	18.125	0.000	48.125	0.000	14.625	0.000	0.000	14.500	0.000	7.344
Rock bass	1.000	0.125	0.375	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133
Pumpkinseed	0.375	10.750	2.375	0.125	10.375	37.750	4.875	13.750	145.663	21.750	5.125	1.875	4.125	1.750	1.125	0.875	16.416
Bluegill	0.000	0.000	0.000	0.875	0.125	0.000	0.000	0.000	119.863	0.250	0.500	0.125	0.000	0.375	1.250	1.875	7.827
Smallmouth bass	0.000	0.250	0.000	0.000	0.875	0.500	0.000	0.000	0.875	0.125	0.125	0.000	0.000	0.000	0.000	0.000	0.172
Largemouth bass	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	1.250	0.125	0.375	0.250	0.625	0.375	0.000	0.125	0.203
Black crappie	2.125	1.750	0.375	22.125	0.250	0.375	0.250	0.500	2.625	0.375	0.000	0.000	0.250	0.125	2.000	0.375	2.094
Lepomis sp.	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.375	0.000	2.375	409.700	0.250	5.125	31.622
Yellow perch	8.500	46.375	50.625	176.375	190.875	63.875	38.125	29.000	429.625	37.875	53.250	14.250	66.250	47.375	14.625	78.750	84.109
Walleye	18.875	22.625	33.250	11.250	10.625	11.750	3.625	0.750	5.500	5.375	0.750	8.500	2.625	2.000	2.750	8.625	9.305
Johnny darter	0.125	0.125	0.000	0.250	5.750	1.750	4.500	0.000	0.250	12.500	2.125	0.125	0.000	0.000	0.000	0.000	1.719
Logperch	0.125	0.000	0.000	0.000	2.125	0.000	0.250	0.000	0.625	0.250	0.500	0.125	0.125	0.125	0.000	0.750	0.313
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.250	0.000	0.000	0.500	0.000	0.000	0.000	1.250	0.000	0.188
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.625	67.000	47.250	60.250	7.125	53.875	14.820
Freshwater drum	6.125	12.125	36.375	6.500	27.875	17.750	70.000	25.000	5.750	163.750	58.250	20.875	4.375	214.763	87.000	830.063	99.161
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	366.6	984.2	746.3	1218.1	1176.3	936.1	323.5	727.5	2749.0	452.8	724.4	364.7	2691.1	1318.1	1160.6	1420.9	1085.0
Number of species	19	20	20	18	20	16	21	17	18	20	21	20	16	18	18	18	31
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	128

TABLE 2.5.7. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Big Bay** (5 m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sea lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Longnose gar	0.375	0.250	0.125	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.078
Alewife	10.375	93.500	2.250	173.000	1.875	0.625	0.000	19.625	0.500	0.000	224.938	0.000	407.363	35.750	13.000	0.375	61.448
Gizzard shad	92.375	73.000	11.500	1482.250	39.075	4.375	0.125	337.500	12.750	0.000	52.250	23.250	58.375	25.875	2.250	2.250	138.575
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake whitefish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cisco (Lake herring)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	0.000	0.000	0.000	0.000	0.000	0.500	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Northern pike	0.000	0.250	0.125	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.039
Mooneye	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
White sucker	2.250	2.125	6.750	8.250	5.125	1.875	9.625	3.250	0.375	0.750	2.875	1.125	1.375	0.875	0.125	0.375	2.945
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Minnow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	2.000	0.875	1.000	0.125	0.125	0.250	0.000	0.125	0.375	0.250	0.000	0.500	0.375	0.250	0.875	0.125	0.453
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	7.875	4.750	38.250	45.375	4.250	11.375	8.000	26.625	4.000	12.125	63.625	8.875	20.250	56.250	18.625	15.375	21.602
Brown bullhead	18.875	35.750	64.125	11.000	21.625	16.750	29.375	61.500	19.875	16.375	32.625	38.000	23.750	12.125	54.625	9.750	29.133
Channel catfish	0.000	0.000	0.625	0.375	0.125	0.000	0.250	0.000	0.000	0.000	0.125	0.000	0.000	0.125	0.375	0.000	0.125
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.023
American eel	0.250	0.375	0.875	0.375	0.625	0.375	0.375	0.000	0.000	0.125	0.125	0.000	0.000	0.000	0.000	0.000	0.219
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trout-perch	41.500	10.875	72.375	4.625	27.375	7.125	23.000	30.750	1.750	1.375	9.125	5.000	3.125	21.625	21.000	14.000	18.414
White perch	113.250	134.000	178.250	789.000	1310.425	851.063	399.500	329.500	368.075	18.250	793.025	145.125	1498.975	554.588	1252.238	363.425	568.668
White bass	0.125	0.125	0.750	2.000	3.250	7.375	0.250	0.375	0.000	0.000	2.125	0.000	0.250	2.625	3.875	0.250	1.461
Sunfish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.375	0.000	50.000	0.000	0.000	0.000	0.000	25.250	0.000	5.664
Rock bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.008
Pumpkinseed	0.125	13.125	1.125	0.375	15.250	19.750	39.625	2.000	87.625	83.875	64.125	67.625	36.625	3.750	6.875	1.875	27.734
Bluegill	0.000	0.000	0.000	0.250	0.250	4.750	3.875	0.125	11.625	124.875	13.625	14.625	0.750	9.625	6.750	16.000	12.945
Smallmouth bass	0.000	0.000	0.000	0.000	0.125	0.000	0.250	0.000	0.000	0.125	0.250	0.000	0.000	0.000	0.000	0.000	0.047
Largemouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.031
Black crappie	0.000	0.000	0.000	0.375	1.000	1.250	0.250	0.250	0.750	0.625	0.500	0.375	0.375	1.000	2.625	0.250	0.602
Lepomis sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.625	0.000	0.000	1060.175	0.000	4.125	70.683
Yellow perch	2.625	11.250	10.250	17.375	62.875	80.250	222.500	16.500	45.889	381.125	153.463	107.650	200.250	90.613	99.388	33.750	95.984
Walleye	18.875	8.625	18.625	8.625	14.750	10.250	10.125	3.125	2.875	7.500	6.125	19.250	16.875	6.500	8.125	8.750	10.563
Johnny darter	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	1.250	0.250	0.000	0.000	0.000	0.000	0.000	0.125
Logperch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.125	0.000	0.250	0.000	0.000	0.125	0.250	0.055
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.047
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	1.375	15.750	9.500	4.750	50.413	5.120
Freshwater drum	2.500	15.000	20.375	4.250	7.125	12.375	24.375	9.500	10.250	21.750	24.375	9.000	15.625	125.500	178.450	139.350	38.738
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	313.4	403.9	427.4	2547.9	1515.3	1030.4	772.1	857.1	567.0	720.9	1510.8	442.0	2300.3	2016.8	1699.5	660.9	1111.6
Number of species	15	16	17	18	18	18	18	18	16	17	22	15	17	17	20	18	30
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	128

TABLE 2.5.8. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Deseronto** (5 m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sea lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Longnose gar	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Alewife	226.500	496.288	128.388	156.000	38.625	6.250	0.000	23.500	9.625	180.063	47.625	277.350	55.375	54.213	106.263	1037.375	177.715
Gizzard shad	121.538	35.250	94.175	27.375	150.563	1.375	22.500	36.125	0.000	32.000	20.875	11.875	1.375	22.000	62.100	29.250	41.773
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake whitefish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cisco (Lake herring)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	0.125	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Northern pike	0.000	0.125	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.023
Mooneye	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
White sucker	3.875	2.000	0.875	0.000	1.500	0.125	0.250	0.250	0.375	0.625	0.375	1.250	1.250	0.125	0.375	0.375	0.852
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Minnow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Common carp	0.250	0.125	0.500	1.250	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.164
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	28.125	23.000	38.250	115.625	7.125	14.125	6.875	29.625	0.000	25.250	25.000	35.625	1.500	18.875	54.750	28.750	28.281
Brown bullhead	21.875	47.500	41.125	9.625	43.875	13.250	15.375	21.875	3.750	69.250	10.625	21.500	37.000	12.500	11.625	18.125	24.930
Channel catfish	0.000	0.125	0.500	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.250	0.125	0.000	0.078
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.008
American eel	1.125	2.000	2.875	0.000	0.750	0.250	0.250	0.000	0.500	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.492
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trout-perch	92.500	54.125	89.500	39.125	10.250	0.125	15.125	0.875	14.500	4.750	7.500	0.125	4.500	6.000	12.375	18.375	23.109
White perch	147.000	29.375	141.125	481.625	87.875	249.300	73.750	544.413	703.788	10.250	194.863	306.238	3075.588	237.588	793.925	226.200	456.431
White bass	0.125	0.125	1.875	0.625	0.375	0.500	0.000	0.000	0.000	0.000	0.000	0.500	1.625	1.250	4.250	0.375	0.727
Sunfish	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.875	0.000	0.375	0.000	0.000	0.000	0.000	1.375	0.000	0.180
Rock bass	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	1.750	0.250	0.000	0.000	0.000	0.000	0.141
Pumpkinseed	0.125	2.750	0.875	0.375	33.250	18.625	12.625	17.125	49.625	118.088	17.500	67.500	19.500	14.750	15.500	19.125	25.459
Bluegill	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.500	0.125	4.500	0.000	0.125	0.875	0.375	0.414
Smallmouth bass	0.000	0.000	0.000	0.375	0.750	0.375	0.000	1.625	1.375	0.500	0.125	1.000	1.250	0.625	0.250	0.000	0.516
Largemouth bass	0.000	0.000	0.000	0.375	0.000	0.250	0.000	0.125	0.000	0.000	1.125	0.000	0.250	1.125	2.125	0.000	0.336
Black crappie	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.125	0.625	0.125	0.000	1.750	1.375	4.875	0.570
Lepomis sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	483.675	0.000	1.000	30.292
Yellow perch	20.625	100.738	101.500	916.000	224.000	171.788	373.413	803.563	176.663	412.700	555.388	683.425	152.138	1030.913	638.313	1087.100	465.516
Walleye	51.375	20.625	39.625	22.250	12.125	3.375	2.625	3.250	2.125	12.500	2.875	7.500	15.125	5.000	5.250	9.875	13.469
Johnny darter	0.125	0.000	0.000	0.000	0.375	0.125	2.000	0.000	1.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.266
Logperch	0.000	0.000	0.000	0.000	1.625	0.375	0.000	0.000	0.500	1.000	0.125	0.375	0.000	3.625	0.125	0.750	0.531
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.750	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.219
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.250	11.500	16.125	20.625	117.300	4.625	4.250	10.980
Freshwater drum	7.250	7.625	23.625	3.250	21.000	6.750	6.125	1.250	5.125	16.500	1.875	15.375	15.625	8.250	22.000	24.000	11.602
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	722.7	821.8	704.9	1773.9	634.6	487.2	531.2	1487.6	969.0	886.7	900.0	1450.8	3402.9	2020.8	1737.6	2510.2	1315.1
Total of species	17	16	16	14	18	19	13	17	13	20	19	19	16	21	20	16	29
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	128

TABLE 2.5.9. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Hay Bay** (7 m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sea lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Longnose gar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alewife	8.375	21.125	198.625	256.500	19.250	21.250	122.225	1051.200	466.556	565.963	21.125	1.750	67.063	72.088	394.425	695.188	248.919
Gizzard shad	0.000	0.250	2.500	39.875	2.250	0.000	0.000	0.750	46.000	2.625	0.125	0.000	0.125	0.000	0.375	0.125	5.938
Chinook salmon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake whitefish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cisco (Lake herring)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rainbow smelt	2.000	1.000	0.000	0.250	0.000	0.125	0.000	0.125	0.125	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.234
Northern pike	0.125	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.125	0.055
Mooneye	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
White sucker	7.625	6.875	2.375	0.500	0.750	3.250	1.875	4.750	1.500	3.500	0.125	5.875	8.250	0.000	0.625	4.875	3.297
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Minnow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	0.125	2.000	0.625	0.250	0.000	0.000	0.000	0.125	0.000	0.250	0.000	0.000	0.000	0.875	0.000	0.000	0.266
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.008
Spottail shiner	5.875	21.500	8.000	22.625	77.625	13.125	57.625	134.625	4.875	63.513	54.000	53.250	64.375	79.113	133.950	188.575	61.416
Brown bullhead	4.625	9.125	14.125	30.500	0.500	1.750	59.375	22.250	20.375	32.750	15.750	8.000	10.375	10.500	15.000	8.875	16.492
Channel catfish	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
American eel	4.375	0.875	6.375	0.125	1.875	0.250	0.250	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.891
Burbot	0.000	0.000	0.000	0.125	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trout-perch	119.000	34.625	82.875	10.750	249.500	19.500	2.250	18.500	1.625	5.750	2.750	3.750	77.500	1.750	3.000	59.500	43.289
White perch	26.000	85.875	34.875	59.125	6.125	297.563	6.625	565.213	59.250	9.250	132.563	14.750	495.163	24.625	504.113	27.500	146.788
White bass	0.000	0.000	1.375	0.000	0.000	0.250	0.000	0.000	0.125	0.000	0.000	1.750	0.125	0.125	1.375	1.375	0.406
Sunfish	0.000	0.375	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
Rock bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.016
Pumpkinseed	0.000	1.000	2.250	7.875	0.125	2.750	4.875	76.875	24.500	19.625	11.875	0.750	4.625	1.125	44.500	11.375	13.383
Bluegill	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.008
Smallmouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.250	0.000	0.000	0.000	0.000	0.000	0.078
Largemouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	1.750	0.000	0.000	0.000	0.000	0.000	0.125
Black crappie	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.375	0.875	0.000	0.141
Lepomis sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.375	0.000	0.000	0.836
Yellow perch	21.250	23.375	29.250	417.500	145.113	560.963	539.125	1488.375	658.125	726.475	856.588	119.200	551.850	278.638	580.700	906.500	493.939
Walleye	9.875	13.125	14.750	12.250	2.000	2.625	2.375	12.125	2.250	7.125	3.250	1.750	3.125	4.125	7.125	8.500	6.648
Johnny darter	0.000	0.000	0.000	0.000	0.625	0.125	0.000	0.000	0.000	0.000	1.750	0.000	0.000	0.000	0.000	0.125	0.164
Logperch	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.125	0.375	0.250	1.250	0.172
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	1.250	14.250	3.500	40.125	6.000	17.125	5.148
Freshwater drum	0.375	16.250	0.375	1.000	2.375	1.750	0.750	1.375	1.750	4.375	4.875	6.875	10.500	16.375	39.125	6.000	7.133
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Slimy sculpin	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Total	209.6	237.6	398.4	859.3	509.0	925.4	797.5	3376.8	1287.1	1442.8	1109.0	232.1	1296.8	544.6	1731.7	1937.1	1055.9
Number of species	13	16	14	15	16	15	12	16	13	16	15	13	15	14	17	17	30
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	128

TABLE 2.5.10. Species-specific catch per trawl (6 min duration; 1/4 mile) by year in the fish community index bottom trawling program at **Conway** (24m depth), Bay of Quinte. Catches are the total number of fish observed at each site for the number of trawls indicated. Total catch and number of species caught are indicated.

	Year																
Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Silver lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.005
Sea lamprey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Longnose gar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alewife	345.338	66.250	35.425	1.625	83.125	245.325	0.000	0.000	248.625	0.000	0.000	2.250	1.917	0.417	9.667	0.083	65.003
Gizzard shad	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.167	0.000	0.081
Chinook salmon	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.083	0.000	0.031
Brown trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.167	0.000	0.000	0.000	0.000	0.018
Lake trout	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.250	0.000	0.417	0.000	0.000	0.000	0.049
Lake whitefish	28.500	4.250	40.875	28.000	7.000	6.375	0.375	0.000	2.250	1.000	1.000	8.083	0.750	3.083	3.833	4.750	8.758
Cisco (Lake herring)	0.125	2.750	15.375	1.375	0.000	0.000	0.125	0.000	0.000	0.000	0.250	3.000	0.083	7.667	4.500	2.000	2.328
Coregonus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.005
Rainbow smelt	24.125	2.500	11.125	629.375	104.625	46.625	59.750	0.000	0.000	0.000	39.625	10.167	3.583	6.750	0.083	25.167	60.219
Northern pike	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mooneye	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
White sucker	19.250	2.250	1.250	0.125	1.500	1.375	1.000	0.750	15.250	134.825	28.750	6.667	7.417	4.750	3.167	11.250	14.973
Moxostoma sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Minnow	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lake chub	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common carp	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Emerald shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spottail shiner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Brown bullhead	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Channel catfish	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Ictalurus sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
American eel	0.500	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Burbot	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.005
Threespine stickleback	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.005
Trout-perch	160.513	272.625	395.275	116.750	146.750	253.538	26.750	1.750	82.125	139.438	58.225	53.667	43.333	12.250	0.500	1.000	110.280
White perch	0.500	48.000	0.125	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	0.000	3.258
White bass	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.068
Sunfish	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rock bass	0.125	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Pumpkinseed	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bluegill	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Smallmouth bass	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Largemouth bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Black crappie	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lepomis sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Yellow perch	21.375	10.750	6.875	1.750	2.875	13.625	3.250	41.375	41.000	134.700	181.238	178.133	58.667	53.750	146.567	20.000	57.246
Walleye	4.875	23.250	13.625	3.500	1.625	0.125	1.250	0.125	0.000	1.250	0.000	0.250	1.000	0.083	0.417	0.417	3.237
Johnny darter	0.000	0.000	0.250	0.375	1.375	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172
Logperch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brook silverside	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Round goby	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	282.225	79.167	127.208	40.833	173.192	43.945
Freshwater drum	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.250	0.000	0.083	0.500	0.000	0.083
Sculpin sp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mottled sculpin	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Slimy sculpin	0.000	0.000	0.250	0.125	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Total	605.2	433.9	520.8	783.0	348.9	568.6	92.5	44.0	389.4	412.1	310.0	545.0	196.5	216.2	215.2	237.9	369.9
Number of species	11	15	13	10	8	11	7	4	6	8	9	13	12	11	14	9	29
Number of trawls	8	8	8	8	8	8	8	8	8	8	8	12	12	12	12	12	148

TABLE 2.5.11. Mean catch-per-trawl of **age-0 lake whitefish** at two sites, Conway in the lower Bay of Quinte and EB03 near Timber Island in eastern Lake Ontario, 1992-2007. Four replicate trawls on each of two to four visits during August and early September were made at each site. Distances of each trawl drag were 1/4 mile for Conway and 1/2 mile for EB03.

	Conway	N	EB03 (Timber Island)	N
1992	23.4	8	0.9	12
1993	3.1	8	4.7	12
1994	40.5	8	79.7	8
1995	27.1	8	17.1	8
1996	2.6	8	0.8	8
1997	5.1	8	6.0	8
1998	0.4	8	0.0	8
1999	0.0	8	0.0	8
2000	0.4	8	0.0	8
2001	0.1	8	0.0	8
2002	0.1	8	0.0	8
2003	8.1	12	44.9	16
2004	0.0	12	2.1	12
2005	2.8	12	49.8	12
2006	2.4	12	3.6	8
2007	0.8	12	0.3	12

TABLE 2.5.12. Mean catch-per-trawl of **age-0 lake herring** at Conway in the lower Bay of Quinte, 1992-2007. Four replicate trawls on each of two to four visits during August and early September were made at the Conway site. Distances of each trawl drag was 1/4 mile.

	Conway	N
1992	0.0	8
1993	1.5	8
1994	7.7	8
1995	1.3	8
1996	0.0	8
1997	0.0	8
1998	0.1	8
1999	0.0	8
2000	0.0	8
2001	0.0	8
2002	0.1	8
2003	2.8	12
2004	0.1	12
2005	7.2	12
2006	4.5	12
2007	2.0	12

TABLE 2.5.13. Mean catch-per-trawl of **age-0 yellow perch** at six Bay of Quinte sites, 1992-2007. Four replicate trawls on each of two to three visits during August and early September were made at each site. Distance of each trawl drag was 1/4 mile.

	Trenton	Belleville	Big Bay	Deseronto	Hay Bay	Conway	Mean	Number of trawls
1992	3.1	1.3	0.4	0.1	0.5	0.0	0.9	48
1993	203.7	14.0	0.4	36.3	1.6	0.3	42.7	48
1994	526.6	50.6	10.3	101.5	29.3	6.9	120.8	48
1995	730.4	101.1	9.5	764.5	268.9	0.0	312.4	48
1996	2.6	2.9	4.3	2.5	8.5	0.1	3.5	48
1997	302.0	4.0	36.0	135.0	526.0	0.0	167.2	48
1998	13.1	14.0	11.5	0.1	2.9	0.0	7.0	48
1999	24.5	7.0	4.9	638.7	900.3	0.0	262.6	48
2000	0.0	5.8	5.4	0.8	6.0	0.3	3.0	48
2001	158.0	27.6	16.8	71.8	127.0	0.0	66.9	48
2002	0.0	0.3	9.2	141.8	241.1	0.0	65.4	48
2003	228.5	3.8	0.9	9.2	1.6	0.5	40.8	52
2004	0.0	0.9	4.5	8.4	18.0	0.0	5.3	52
2005	202.8	37.5	24.8	444.7	61.9	0.0	128.6	52
2006	3.8	3.5	51.7	532.8	306.0	0.2	149.7	52
2007	284.3	70.9	29.6	883.5	776.0	0.1	340.7	52

TABLE 2.5.14. Mean catch-per-trawl of **age-0 walleye** at six Bay of Quinte sites, 1992-2007. Four replicate trawls on each of two to three visits during August and early September were made at each site. Distance of each trawl drag was 1/4 mile.

	Trenton	Belleville	Big Bay	Deseronto	Hay Bay	Conway	Mean	Number of trawls
1992	6.8	12.4	14.0	37.9	6.1	0.8	13.0	48
1993	8.8	16.0	5.0	11.3	1.1	11.9	9.0	48
1994	17.0	21.0	15.0	23.8	11.5	12.5	16.8	48
1995	14.1	8.3	2.6	8.3	5.5	0.9	6.6	48
1996	4.3	7.6	4.9	1.1	0.0	1.1	3.2	48
1997	2.8	7.6	6.1	0.3	0.1	0.0	2.8	48
1998	0.1	0.4	0.6	0.1	0.0	0.0	0.2	48
1999	1.1	0.4	0.4	1.4	9.1	0.1	2.1	48
2000	0.0	3.8	1.0	0.0	0.1	0.0	0.8	48
2001	9.5	4.5	4.8	6.8	3.3	0.1	4.8	48
2002	0.0	0.0	1.1	0.1	0.0	0.0	0.2	48
2003	10.3	8.3	16.8	1.9	0.4	0.0	6.3	52
2004	0.0	0.6	11.4	1.4	0.9	0.0	2.4	52
2005	0.8	1.4	3.8	1.8	1.1	0.0	1.5	52
2006	0.0	1.0	3.0	2.8	5.9	0.3	2.1	52
2007	4.1	6.1	5.4	5.6	5.6	0.2	4.5	52

TABLE 2.5.15. Age distribution of 309 walleye sampled from summer bottom trawls, Bay of Quinte, 2007. Also shown are mean fork length and mean weight. Fish of less than 151 mm fork length (n = 184) were assigned an age of 0 while those over 150 mm fork length (n = 125) were aged using otoliths.

	Age (years) / Year class								
	0	1	2	3	4	5	6	14	
	2007	2006	2005	2004	2003	2002	2001	1993	Total
Bay of Quinte	205	46	44	2	9	0	2	1	309
Mean fork length (mm)	131	237	349	416	429		527	684	
Mean weight (g)	23	132	444	760	917		1553	2826	

TABLE 2.5.16. Mean catch-per-trawl of round goby at three Ontario and six Bay of Quinte sites, 1992-2007.

	EB02	EB03	EB06	Trenton	Belleville	Big Bay	Deseronto	Hay Bay	Conway	Lake Ontario	Bay of Quinte	Number of trawls
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90
1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85
1994	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90
1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93
1998	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80
2001	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.2	78
2002	0.0	0.0	0.0	0.0	1.6	0.1	11.5	1.3	0.5	0.0	2.5	80
2003	0.1	0.0	0.0	2.9	67.0	1.4	16.1	14.3	282.2	0.0	64.0	92
2004	250.1	0.3	0.0	8.5	47.3	15.8	20.6	3.5	79.2	83.5	29.1	86
2005	29.8	798.9	0.0	13.1	60.3	9.5	117.3	40.1	127.2	276.2	61.3	85
2006	43.7	850.3	6.0	5.3	7.1	4.8	4.6	6.0	40.8	300.0	11.4	81
2007	119.8	910.1	82.9	0.8	53.9	50.4	4.3	17.1	173.2	370.9	49.9	88

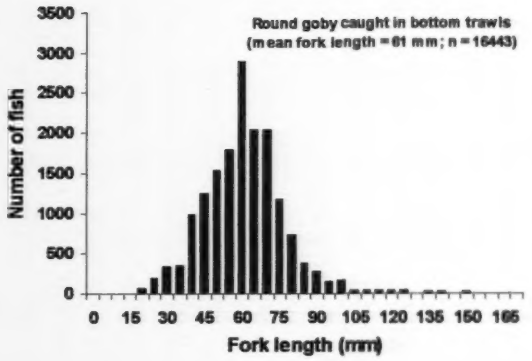

FIG. 2.5.2. Round goby size distribution for fish caught in bottom trawls, 2007.

TABLE 2.5.17. Biological attribute information for six deepwater scuplin caught at Rocky Point (100 m water depth) on June 28, 2007. Two trawls were made on that date.

	Fish	Total length (mm)	Weight (g)	Sex
Trawl 1	1	125	21.37	Female
	2	92	7.78	Male
	3	95	8.51	Male
	4	86	6.39	Male
	5	92	7.47	Unknown
Trawl 2	1	83	4.53	Male

2.6 Lake-wide Hydroacoustic Assessment of Prey Fish

The status of prey fish in Lake Ontario is assessed in hydroacoustic and mid-water trawling surveys conducted jointly since 1991 by Ontario Ministry of Natural Resources (OMNR) and New York State of Department of Environmental Conservation (NYSDEC). Surveys are conducted using the NYSDEC vessel the Seth Green. The surveys are conducted in mid-summer and cover the entire lake, including both New York and Ontario waters. Inclement weather limited the 2007 survey to four transects in the main lake (five transects were planned), and one transect in the Kingston Basin. Acoustic data used to estimate population densities were collected using a Biosonics 120 kHz split-beam echosounder, and additionally midwater trawls were made to measure the species composition and biological attributes of the prey fish.

The alewife population estimate for 2007 is 62 million yearling-and-older fish, which, after an increase in 2006, is a return to a very low level similar to that seen in 2005 (Fig. 2.6.1). Based on alewife size distribution in the trawls, the 2007 estimate translates into a biomass estimate of 1,650 MT. Midwater trawl catches made during the survey suggest that the population was dominated by 2-year old fish.

The smelt population estimate for 2006 was 146 million yearling-and-older fish, which, based on the size composition in the trawls, translates into a biomass estimate of 1,434 MT (Fig. 2.6.2). This level is very close to that observed in the previous year, and similar to levels generally observed since the turn of the century. Midwater trawl catches made during the survey contained too few smelt to characterize the size composition of the population with any confidence, but there was no evidence of a strong class of yearlings to boost the population in the near future.

Three-spine sticklebacks started to appear in the midwater trawl catches in the mid 1990s, and were caught with increasing regularity since then. In 2006, however, juveniles disappeared from the catches, followed by adult-size fish in 2007. The repeated near-absence of juveniles in 2007 suggests that the population will remain depressed in 2008.

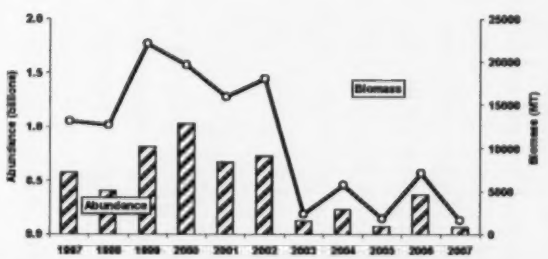

FIG. 2.6.1. Abundance and biomass of yearling-and-older alewife. Abundance estimates were obtained directly from hydroacoustic surveys, biomass estimates were obtained by applying average weights measured in midwater trawls to abundance estimates. Average weights used in biomass calculations in 2002, 2004 and 2005 were based on pooled data from other years.

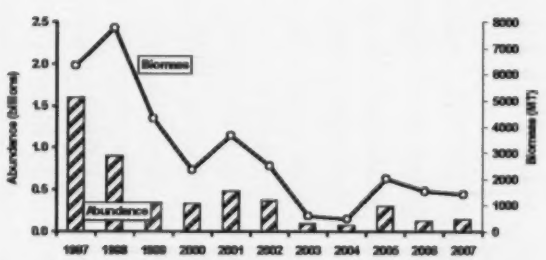

FIG. 2.6.2. Abundance and biomass of yearling-and-older rainbow smelt. Abundance estimates were obtained directly from hydroacoustic surveys, biomass estimates were obtained by applying average weights measured in midwater trawls to hydroacoustic abundance estimates. Average weights used in biomass calculations in 2002 through 2005 were based on pooled data from other years.

2.7 Nearshore Community Index Netting

The nearshore fish community is monitored through a more recently established trapnet assessment program. These trapnet surveys include examination of the fish communities in areas of concern on Lake Ontario and the St. Lawrence River. The provincial standard nearshore community index netting program (NSCIN) was initiated on the upper Bay of Quinte (Trenton to Deseronto) in 2001, and was expanded to include the lower Bay of Quinte (Deseronto to Lake Ontario) in 2002. Both upper and lower Bay of Quinte were sampled from 2002-2005.

In 2006, the NSCIN program was conducted on Hamilton Harbour and the Toronto waterfront area thanks to partnerships developed with the Department of Fisheries and Oceans Canada and the Toronto Region Conservation Authority.

In 2007, NSCIN was conducted in five areas: Lake St. Francis (St. Lawrence River), the upper Bay of Quinte, East and West Lakes (two Lake Ontario embayments on the southwest side of Prince Edward County), and the Toronto waterfront area (Fig. 2.7.1).

The NSCIN program used 6-foot trapnets and was designed to evaluate the abundance and other biological attributes of fish species that inhabit the littoral area. Suitable trapnet sites were chosen from randomly selected UTM grids that contained shoreline in the areas under investigation. Catches from the 2007 NSCIN project are summarized below by geographic area and by species of interest.

Lake St. Francis

The Lake St. Francis NSCIN project was conducted in partnership with the Raisin Region Conservation Authority, at Cornwall. Thirty-six trapnet sites were sampled from Aug 13-30 with water temperatures ranging from 21.5-24.2 °C (Table 2.7.1). Nearly 6,000 fish comprising 22 species were captured (Table 2.7.2). The most abundant species by number were brown bullhead (4,463), pumpkinseed (289), black crappie (273), yellow perch (198), rock bass (185), and bluegill (111). Of note was the relatively high abundance of redhorse suckers, including silver (103) and shorthead redhorse (10). Also, seven silver lamprey were caught.

Bay of Quinte

Thirty-six trapnet sites were sampled on the upper Bay of Quinte from Sep 4-25 with water temperatures ranging from 15.8-23.6 °C (Table 2.7.1). Over 4,700 fish comprising 22 species were captured (Table 2.7.2).

TABLE 2.7.1. Survey information for the 2007 NSCIN trapnet program on Lake St. Francis, upper Bay of Quinte, East Lake, West Lake and the Toronto waterfront area.

	Lake St. Francis	Upper Bay of Quinte	East Lake	West Lake	Toronto Waterfront
Survey dates	Aug 13-30	Sep 4-25	Sep 4-9	Aug 7-21	Aug 17-27
Water temperature (°C)	21.5-24.2 °C	15.8-23.6 °C	17.0-20.5 °C	19.0-25.5 °C	14.5-19.9 °C
No. of trapnet lifts	36	36	18	18	24
No. sites by depth (m):					
Target (2-2.5 m)	12	19	6	16	15
> Target (max)	6	9	4	0	9
< Target (min)	18	8	8	2	0
No. sites by substrate:					
Hard	31	33	15	14	20
Soft	5	3	3	4	4
No. sites by cover:					
None	4	4	1	4	0
1-25%	17	17	3	9	6
25-75%	14	10	10	5	15
>75%	1	5	4	0	3

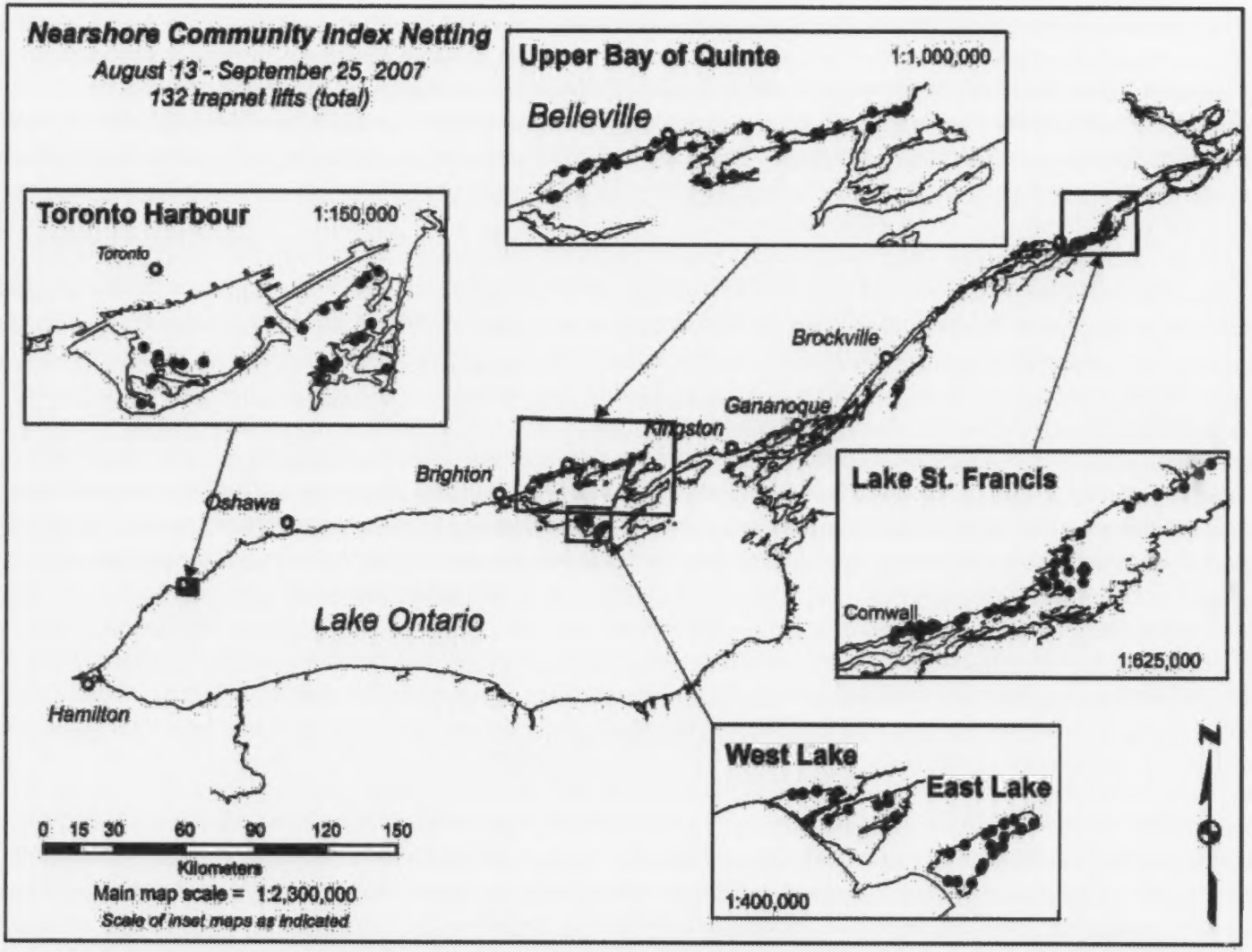

FIG. 2.7.1. Map of Lake Ontario and the St. Lawrence River indicating NSCIN trapnet locations (2007) in each of five areas: Lake St. Francis, the upper Bay of Quinte, East Lake, West Lake, and the Toronto waterfront area.

TABLE 2.7.2. Species-specific catch in the 2007 NSCIN trapnet program on Lake St. Francis, the upper Bay of Quinte, East Lake, West Lake and the Toronto waterfront area. Statistics shown arithmetic and geometric mean catch-per-trapnet (CUE), percent relative standard error of mean log10(catch+1), %RSE = 100*SE/mean, and mean fork or total length (mm). A total of 27 species were caught.

	Lake St. Francis				Bay of Quinte				East Lake				West Lake				Toronto Waterfront			
	Arithmetic mean CUE	Geometric mean CUE	RSE (%)	Mean length (mm)	Arithmetic mean CUE	Geometric mean CUE	RSE (%)	Mean length (mm)	Arithmetic mean CUE	Geometric mean CUE	RSE (%)	Mean length (mm)	Arithmetic mean CUE	Geometric mean CUE	RSE (%)	Mean length (mm)	Arithmetic mean CUE	Geometric mean CUE	RSE (%)	Mean length (mm)
Silver lamprey	0.194	0.126	43		0.000				0.000				0.000				0.000			
Longnose gar	0.417	0.198	43	802	2.917	0.666	30	704	2.444	1.443	23	693	2.556	1.542	21	744	0.000			
Bowfin	0.028	0.019	100	660	0.917	0.574	22	592	0.278	0.193	47	574	0.056	0.039	100	440	0.083	0.047	100	640
Alewife	0.000	0.000			0.000				0.000				0.000				4.583	2.045	20	138
Gizzard shad	0.000	0.000			0.389	0.224	37	238	0.000				0.111	0.080	69	345	0.417	0.257	39	359
Northern pike	0.917	0.603	20	683	0.444	0.269	31	555	1.333	1.106	15	479	2.056	1.587	15	504	0.833	0.583	23	722
White sucker	2.167	1.078	20	419	0.444	0.324	24	420	1.000	0.522	38	402	0.333	0.220	47	363	3.833	1.769	21	470
Silver redhorse	2.861	1.898	12	470	0.639	0.248	41	487	0.000				0.000				0.000			
Shorthead redhorse	0.278	0.161	43	493	0.194	0.108	53	409	0.000				0.000				0.000			
River redhorse	0.000	0.000			0.111	0.080	48	570	0.000				0.000				0.000			
Common carp	0.917	0.518	25	618	0.194	0.144	34	603	0.167	0.122	54	773	0.111	0.063	100	460	2.500	1.739	15	659
Golden shiner	0.222	0.097	64	143	0.000				0.000				0.056	0.039	100		0.000			
Common shiner	0.028	0.019	100	130	0.000				0.000				0.000				0.000			
Brown bullhead	123.972	38.565	8	256	7.250	2.696	15	276	19.111	6.465	18	269	12.222	3.562	23	280	14.792	8.043	11	318
Channel catfish	0.056	0.039	70	645	0.722	0.254	42	503	0.056	0.039	100	640	0.056	0.039	100	530	0.000			
American eel	0.333	0.226	31	872	0.000				0.000				0.000				0.000			
White perch	0.000	0.000			4.611	1.145	26	196	0.167	0.105	71	250	10.889	2.205	31	222	0.000			
White bass	0.000	0.000			0.028	0.019	100	250	0.000				0.000				0.000			
Rock bass	5.139	2.468	14	142	4.833	1.966	17	179	1.778	0.864	30	201	2.167	1.593	16	172	1.125	0.563	31	137
Pumpkinseed	8.028	2.276	18	147	18.611	7.883	11	142	38.500	23.167	7	170	16.611	14.096	6	144	16.292	3.392	22	118
Bluegill	3.083	0.774	30	161	63.917	29.509	7	139	42.222	26.124	8	153	29.000	23.211	5	144	3.958	0.806	36	135
Smallmouth bass	1.083	0.688	19	401	0.111	0.080	48	345	2.500	1.160	28	279	0.722	0.370	42	298	0.042	0.029	100	390
Largemouth bass	1.139	0.517	27	267	4.528	2.595	13	264	1.889	1.330	19	260	1.056	0.634	31	218	1.250	0.470	41	205
Black crappie	7.583	2.456	18	212	12.917	6.784	10	232	0.111	0.080	69	235	1.722	1.145	22	236	0.417	0.266	38	186
Yellow perch	5.500	2.175	17	181	4.722	2.168	16	192	0.333	0.193	57	210	0.500	0.251	53	202	5.958	2.928	17	176
Walleye	0.722	0.472	23	520	1.611	0.794	23	464	1.833	1.414	16	417	1.500	1.004	23	379	0.083	0.059	69	610
Freshwater drum	0.250	0.180	32	611	1.250	0.661	22	429	0.167	0.122	54	567	0.167	0.122	54	723	1.292	0.847	21	548
Total CUE	165				131				114				82				57			
Number of species	22				22				17				19				16			
Number of nets	36				36				18				18				24			
Total catch	5,937				4,729				2,050				1,474				1,379			

The most abundant species by number were bluegill (2,301), pumpkinseed (670), black crappie (465), brown bullhead (261), rock bass (174), yellow perch (170) and largemouth bass (163). Of note was the capture of four river redhorse (*Moxostoma carinatum*), a species of "special concern" (see Section 7.3).

East Lake

The East Lake NSCIN project was conducted in partnership with a local commercial fisherman. Mr. David Baverstock volunteered his time, staff, and boat to carry out this survey. Eighteen trapnet sites were sampled from Sep 4-9 with water temperatures ranging from 17.0-20.5 °C (Table 2.7.1). Just over 2,000 fish comprising 17 species were captured (Table 2.7.2). The most abundant species by number were bluegill (760), pumpkinseed (693), brown bullhead (344), smallmouth bass (45) and longnose gar (44).

West Lake

Eighteen trapnet sites were sampled from Aug 7-21 with water temperatures ranging from 19.0-25.5 °C (Table 2.7.1). Nearly 1,500 fish comprising 19 species were captured (Table 2.7.2). The most abundant species by number were bluegill (522), pumpkinseed (299), brown bullhead (220), white perch (196), longnose gar (46), and rock bass (39).

Toronto Waterfront

The Toronto waterfront NSCIN project was conducted in partnership with the Toronto Region Conservation Authority. Twenty-four trapnet sites were sampled from Aug 17-27 with water temperatures ranging from 14.5-19.9 °C (Table 2.7.1). Nearly 1,400 fish comprising 16 species were captured (Table 2.7.2). The most abundant species by number were pumpkinseed (391), brown bullhead (355), yellow perch (143), alewife (110), bluegill (95), and white sucker (92).

Status of Selected Species

Northern pike

Northern pike were most abundant in West Lake and least common in the upper Bay of Quinte (Table 2.7.2). Age-2 and age-3 fish were most common in the upper Bay of Quinte (Table 2.7.3). Length-at-age data for the upper Bay of Quinte suggests that pike are relatively fast growing at very young ages but slow growing thereafter.

Pumpkinseed

Pumpkinseed were most abundant in East Lake and least abundant in Lake St. Francis and the Toronto waterfront area (Table 2.7.2). Pumpkinseed were youngest in the Toronto waterfront area and oldest in East Lake (Table 2.7.4). Length-at-age was highest in Lake St. Francis and lowest in the Toronto waterfront area.

Bluegill

Bluegill were most abundant in the upper Bay of Quinte and least abundant in Lake St. Francis and the Toronto waterfront area (Table 2.7.2). Bluegill were youngest in the Toronto waterfront area and West Lake and oldest in East Lake (Table 2.7.5). Length-at-age was highest in Lake St. Francis.

Smallmouth bass

Smallmouth bass were most abundant in East Lake and Lake St. Francis and least abundant in the Toronto waterfront area and the upper Bay of Quinte (Table 2.7.2). Smallmouth were youngest in the upper Bay of Quinte and East lake oldest in Lake St. Francis (Table 2.7.6). Length-at-age was similar across all waterbodies.

Largemouth bass

Largemouth bass were most abundant in the upper Bay of Quinte (Table 2.7.2). Largemouth showed a broad age distribution in the upper Bay of Quinte and Lake St. Francis (Table 2.7.7). Length-at-age was similar

TABLE 2.7.3. Age distribution and mean length and weight of northern pike sampled from NSCIN trapnets in the upper Bay of Quinte (n = 16). Ages were interpreted using cleithra and scales. Age interpretation were not available at the time of printing for the other waterbodies.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Upper Bay of Quinte																				
Number	2	5	4	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	473	536	557	506	671			677												
Mean weight (g)	815	1207	1295	753	2500			1998												

TABLE 2.7.4. Age distribution and mean length and weight of pumpkinseed (n = 159) sampled from NSCIN trapnets in Lake St. Francis (n = 33), the upper Bay of Quinte (n = 28), East Lake (n = 30), West Lake (n = 37), and the Toronto waterfront area (n = 31), 2007. Ages were interpreted using scales.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	0	7	13	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		126	157	179	195															
Mean weight (g)		55	119	181	199															
Upper Bay of Quinte																				
Number	0	2	3	12	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		114	133	141	151	172														
Mean weight (g)		31	60	74	91	140														
East Lake																				
Number	0	0	2	1	22	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)			136	156	165	171	192													
Mean weight (g)			57	94	117	118	161													
West Lake																				
Number	0	3	12	6	14	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		118	137	145	164	175	176													
Mean weight (g)		43	69	78	120	145	132													
Toronto waterfront																				
Number	11	15	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	95	110	121																	
Mean weight (g)	21	34	47																	

TABLE 2.7.5. Age distribution and mean length and weight of bluegill (n = 157) sampled from NSCIN trapnets in Lake St. Francis (n = 30), the upper Bay of Quinte (n = 32), East Lake (n = 30), West Lake (n = 34), and the Toronto waterfront area (n = 31), 2007. Ages were interpreted using scales.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	10	4	8	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	132	140	169	181	198	174	215													
Mean weight (g)	61	67	129	161	191	145	269													
Upper Bay of Quinte																				
Number	2	10	6	3	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	122	133	144	148	152	172	171	181												
Mean weight (g)	41	56	78	66	87	123	136	137												
East Lake																				
Number	0	0	0	11	8	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)				142	165	165	175	182												
Mean weight (g)				66	106	102	127	121												
West Lake																				
Number	1	12	11	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	102	119	138	150																
Mean weight (g)	26	41	67	87																
Toronto waterfront																				
Number	11	17	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	126	132	150																	
Mean weight (g)	50	62	90																	

TABLE 2.7.6. Age distribution and mean length and weight of smallmouth bass (n = 68) sampled from NSCIN trapnets in Lake St. Francis (n = 23), the upper Bay of Quinte (n = 3), East Lake (n = 29), West Lake (n = 12), and the Toronto waterfront area (n = 1), 2007. Ages were interpreted using scales.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	1	1	0	5	0	3	6	3	3	0	1	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	141	286		333		400	407	422	423		474									
Mean weight (g)	53	435		752		1390	1330	1499	1531		1477									
Upper Bay of Quinte																				
Number	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		246	309																	
Mean weight (g)		285	597																	
East Lake																				
Number	0	19	4	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		248	290	377		350	394													
Mean weight (g)		241	393	902		753	1218													
West Lake																				
Number	2	6	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	194	298	302		380															
Mean weight (g)	131	498	504		1227															
Toronto waterfront																				
Number	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)					386															
Mean weight (g)					1287															

TABLE 2.7.7. Age distribution and mean length and weight of largemouth bass (n = 117) sampled from NSCIN trapnets in Lake St. Francis (n = 18), the upper Bay of Quinte (n = 35), East Lake (n = 30), West Lake (n = 17), and the Toronto waterfront area (n = 17), 2007. Ages were interpreted using scales.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	2	7	2	0	0	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	159	233	253			370	421	352	435											
Mean weight (g)	73	255	322			985	1458	889	1471											
Upper Bay of Quinte																				
Number	3	8	11	4	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	190	220	255	268	310	310	343													
Mean weight (g)	115	213	294	324	591	603	770													
East Lake																				
Number	1	12	12	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	160	241	266	279		361														
Mean weight (g)	68	228	315	323		788														
West Lake																				
Number	4	8	2		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	169	211	253		285															
Mean weight (g)	73	150	269		408															
Toronto waterfront																				
Number	6	6	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	159	177		257	365	366														
Mean weight (g)	70	93		323	1003	843														

TABLE 2.7.8. Age distribution and mean length and weight of black crappie (n = 96) sampled from NSCIN trapnets in Lake St. Francis (n = 35), the upper Bay of Quinte (n = 30), East Lake (n = 2), West Lake (n = 19), and the Toronto waterfront area (n = 10), 2007. Ages were interpreted using scales.

												Age								
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	3	28	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	167	211	223	311																
Mean weight (g)	85	181	231	565																
Upper Bay of Quinte																				
Number	0	21	6	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		238	265	256	298															
Mean weight (g)		266	374	365	536															
East Lake																				
Number	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		230																		
Mean weight (g)		239																		
West Lake																				
Number	0	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		225	233																	
Mean weight (g)		215	228																	
Toronto waterfront																				
Number	1	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	158	178			218															
Mean weight (g)	73	111			188															

TABLE 2.7.9. Age distribution and mean length and weight of yellow perch (n = 115) sampled from NSCIN trapnets in Lake St. Francis (n = 34), the upper Bay of Quinte (n = 33), East Lake (n = 6), West Lake (n = 8), and the Toronto waterfront area (n = 34), 2007. Ages were interpreted using scales.

												Age								
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	0	21	9	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		155	174	194			224													
Mean weight (g)		52	71	116			173													
Upper Bay of Quinte																				
Number	1	6	10	8	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	148	142	179	189	225	204	229													
Mean weight (g)	42	38	89	105	185	138	206													
East Lake																				
Number	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)			198	230																
Mean weight (g)			98	147																
West Lake																				
Number	0	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)		191	184	199																
Mean weight (g)		105	94	110																
Toronto waterfront																				
Number	1	29	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	155	177	193																	
Mean weight (g)	55	82	108																	

across all waterbodies.

Black crappie

Black crappie were most abundant in the upper Bay of Quinte the Lake St. Francis, and uncommon in East Lake and the Toronto waterfront area (Table 2.7.2). Age-2 fish dominated the catch in all areas (Table 2.7.8). Length-at-age was highest in the upper Bay of Quinte and lowest in the Toronto waterfront area.

Yellow perch

Yellow perch were most abundant in the Toronto waterfront area, Lake St. Francis and the upper Bay of Quinte, and uncommon in East Lake and East Lake (Table 2.7.2). A broad age distribution was caught in the upper Bay of Quinte. Age-2 fish dominated the catch in Lake St. Francis and the Toronto waterfront area (Table 2.7.9). Length-at-age was similar in Lake St. Francis and the upper Bay of Quinte, and lower in the Toronto waterfront area.

Walleye

Walleye were most abundant in East Lake, the upper Bay of Quinte and West Lake. Walleye were less common in Lake St. Francis and rare in the Toronto waterfront area (Table 2.7.2). A broad range of ages was caught across the waterbodies from age-1 to age-14 years. The most common age was age-4 (2003 year-class), although this year-class was not caught in Lake St. Francis (Table 2.7.10). Other common year-classes were 2005 and 2001. Length-at-age was highest in Lake St. Francis and the upper Bay of Quinte (except for older fish), lower in East Lake, and lowest in West Lake.

TABLE 2.7.10. Age distribution and mean length and weight of walleye (n = 105) sampled from NSCIN trapnets in Lake St. Francis (n = 20), the upper Bay of Quinte (n = 27), East Lake (n = 30), West Lake (n = 26), and the Toronto waterfront area (n = 2), 2007. Ages were interpreted using otolith sections.

	Age																			
Age (years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year-class	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Lake St. Francis																				
Number	1	4	1	0	0	3	0	4	2	2	0	0	2	1	0	0	0	0	0	0
Mean fork length (mm)	274	340	363			535		581	521	644			634	615						
Mean weight (g)	204	425	542			1770		2142	1527	2894			2973	2388						
Upper Bay of Quinte																				
Number	1	10	0	11	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0
Mean fork length (mm)	244	380		493	446	533						527	504	532						
Mean weight (g)	152	592		1439	1013	1471						1517	1237	1727						
East Lake																				
Number	1	4	4	12	2	4	0	0	2	1	0	0	0	0	0	0	0	0	0	0
Mean fork length (mm)	234	338	378	412	432	449			485	555										
Mean weight (g)	113	372	514	731	804	982			1118	1752										
West Lake																				
Number	1	2	9	10	2	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Mean fork length (mm)	237	315	359	385	398			553					511							
Mean weight (g)	141	319	473	589	626			1757					1266							
Toronto waterfront																				
Number	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Mean fork length (mm)			531										682							
Mean weight (g)			2256										4814							

2.8 St. Lawrence River Fish Community Index Netting – Thousand Islands

The St. Lawrence River fish community is dominated by a rich assemblage of warm-water species; over 85 species have been reported. Smallmouth bass and northern pike are the most abundant top predators, while other important members of the fish community include yellow perch, rock bass, brown bullhead, and pumpkinseed. Other less abundant, but important, fish species inhabiting the St. Lawrence River include walleye, lake sturgeon and muskellunge.

The fall gillnetting survey in the Thousand Islands is conducted bi-annually, and it is part of a suite of programs designed to monitor the fisheries resources in the St. Lawrence River. Three other sections of the river also are regularly monitored: the Middle Corridor, Lake St. Lawrence, and Lake St. Francis. The surveys are coordinated between the Ontario Ministry of Natural Resources (OMNR) and the New York State Department of Environmental Conservation (NYSDEC).

The gillnets that were originally used in the St. Lawrence surveys were made of multifilament mesh. Due to insufficient supply of multifilament, we switched over to monofilament beginning in 2001. Between 2001 and 2005 we used both types of gear to assess their relative fishing power. The monofilament nets proved to be more effective, and therefore past catches from the multifilament nets were adjusted (increased) by a factor of 1.58 (see LOMU 2001

TABLE 2.8.1. Catches per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007. Catches from multifilament nets (all catches prior to 2001, and a portion of catches in 2001-2005) were adjusted by a factor of 1.58 to monofilament netting standards initiated in 2001.

	1987	1989	1991	1993	1995	1997	1999	2001	2003	2005	2007
Lake Sturgeon	-	-	-	-	-	-	0.03	-	0.02	0.02	0.02
Longnose gar	-	-	0.03	-	-	0.03	-	-	0.07	0.04	-
Bowfin	0.08	0.13	-	0.06	0.03	0.07	-	0.02	0.07	0.05	0.08
Alewife	0.49	-	0.09	0.03	0.03	-	-	-	-	0.02	0.13
Gizzard shad	-	0.41	0.46	-	-	-	0.03	0.06	-	0.04	0.02
Chinook salmon	-	-	0.03	-	-	-	0.03	0.02	-	-	-
Brown trout	-	0.05	-	-	-	-	-	-	-	-	-
Rainbow trout	-	-	-	-	-	0.03	-	-	-	-	-
Lake trout	-	0.13	-	0.16	0.13	0.13	-	-	-	-	-
Lake herring	-	-	-	-	0.06	-	-	-	-	-	-
Northern pike	4.46	6.73	4.35	3.62	2.61	2.40	2.14	1.33	2.05	1.78	1.25
Muskellunge	-	-	0.03	-	-	-	-	0.02	0.04	-	-
Esocidae hybrids	-	-	-	-	0.03	-	-	-	-	-	-
Mooneye	0.05	-	-	-	-	-	-	-	-	-	-
White sucker	1.09	2.10	1.39	1.49	1.37	1.25	1.78	0.75	0.93	0.64	0.38
Moxostoma sp.	-	0.08	0.06	0.13	0.33	-	0.23	0.08	0.11	0.10	0.06
Common carp	0.05	0.13	0.09	0.03	0.09	0.36	0.13	0.08	0.12	0.04	0.02
Chub	-	0.05	-	-	-	-	-	-	-	0.02	-
Golden shiner	0.05	0.05	-	0.06	0.03	-	0.03	-	-	0.04	0.06
Brown bullhead	2.56	1.79	2.46	1.06	0.95	1.91	3.85	3.00	2.66	4.69	1.13
Channel catfish	0.81	0.08	0.55	0.16	0.30	0.30	0.56	0.25	0.35	0.20	0.67
White perch	0.08	-	0.36	0.03	0.06	-	0.07	0.10	0.02	0.15	-
White bass	0.05	0.60	0.43	0.24	-	0.07	-	-	-	-	-
Rock bass	4.14	4.46	5.44	4.77	5.56	4.87	7.54	9.48	7.23	7.28	10.77
Pumpkinseed	4.61	6.19	5.81	3.89	2.80	2.40	3.23	1.40	1.21	0.67	0.63
Smallmouth bass	3.16	5.67	4.31	2.34	1.55	1.48	3.19	1.67	3.97	7.59	5.06
Bluegill	0.65	0.88	0.43	0.06	-	0.16	0.07	0.02	0.14	0.10	0.02
Largemouth bass	0.13	0.36	0.13	0.16	0.16	0.03	0.23	0.08	0.22	0.33	0.63
Black crappie	0.13	0.16	0.09	0.06	0.03	0.03	0.10	0.06	0.07	0.16	0.06
Yellow perch	27.79	17.62	15.41	16.23	22.67	21.33	22.22	18.06	20.32	14.26	28.65
Walleye	0.21	0.60	0.33	0.33	0.27	0.59	0.07	0.19	0.23	0.23	0.60
Round goby	-	-	-	-	-	-	-	-	-	0.77	0.19
Freshwater drum	-	-	0.09	-	0.03	0.10	-	0.06	0.04	0.30	0.04
Total Catch	50.56	48.25	42.39	34.90	39.11	37.56	45.49	36.75	39.87	39.54	50.46

Annual Report for details). In the 2007 survey we used monofilament nets exclusively.

This section summarizes index gillnetting catches for all fish species (Table 2.8.1) in the Thousand Islands survey in 2007, and reports the population trends for some of the important species. The survey in was conducted between Sep 12 and Oct 4, 2007.

Overall catch

The total catch from 48 gillnet sets in the 2007 Thousand Islands survey was 2,422 fish comprising 21 species (Table 2.8.1 and Fig. 2.8.1). The average number of fish captured per net set during 2007 was 50.46 fish, higher than the catch observed in recent years, and similar to levels observed at the start of the program in the late 1980s (Fig.2.8.2).

Yellow Perch

Yellow perch continue to be the most abundant fish captured in the Thousand Islands gillnet program. The catch in 2007 was the highest in the history of the program, and represents a two-fold increase from the previous survey in 2005, which was lowest in the series (Fig. 2.8.3). Although the age processing of the information is not complete at this time, comparison of size composition between 2005 and 2007 does not suggest that the increase is due to substantial recruitment.

Centrarchids

Six centrarchid species were captured in the netting program: rock bass, pumpkinseed, bluegill, smallmouth bass, largemouth bass and black crappie (Figs, 2.8.4 and 2.8.5). The patterns observed over the history of the Thousand Islands surveys show a continued increase in rock bass, and a continued decrease in pumpkinseed. Smallmouth bass appeared to be on a rebound since 2001, but then decreased somewhat since the previous survey, while largemouth bass appear to be on a steady increase over the same time period. Black crappie returned to approximately historical average after unusually high catches in the previous survey.

Northern Pike

The catch of northern pike has decreased again since the last survey in 2005 (Fig. 2.8.6). There has been a steady decline in the catches of northern pike throughout the 1990s, and although a minor reversal was seen in 2003, further decreases since then suggest that the decline may continue.

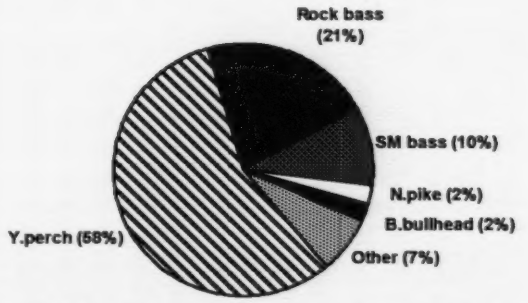

FIG. 2.8.1. Species composition in the 2007 gillnet survey in the Thousand Island area of the St. Lawrence River.

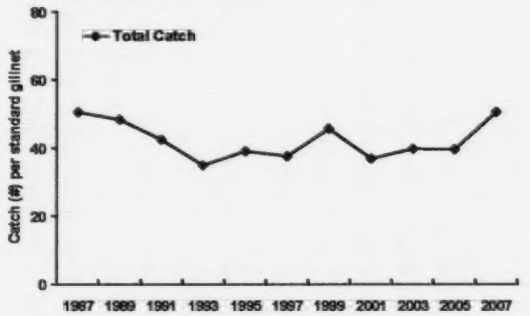

FIG. 2.8.2. Total number of fish (all species) per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007.

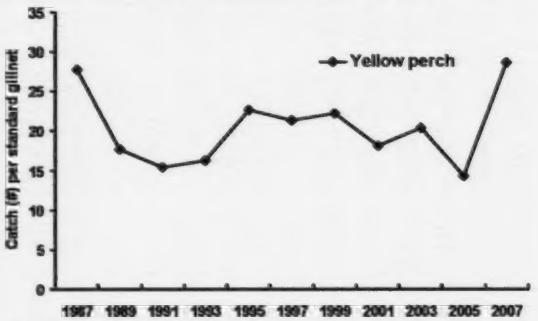

FIG. 2.8.3. Yellow perch catch per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007.

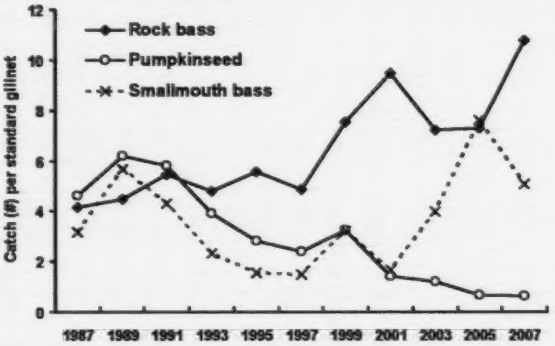

FIG. 2.8.4. Centrarchid catches per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007.

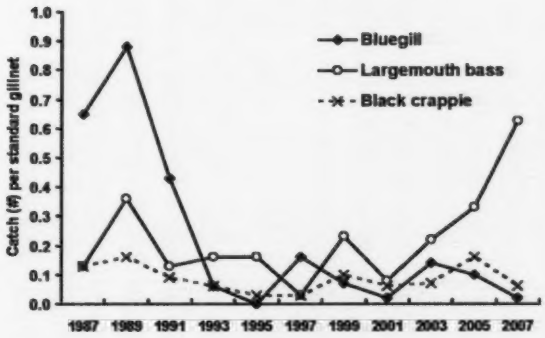

FIG. 2.8.5. Centrarchid catches per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007.

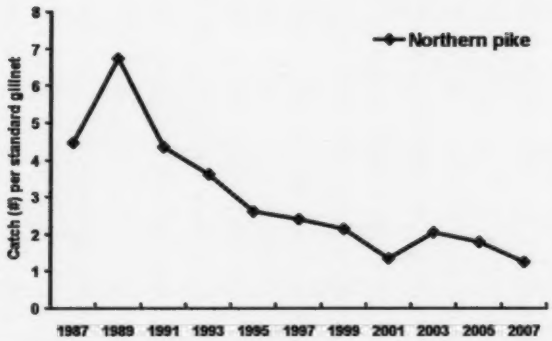

FIG. 2.8.6. Northern pike catch per standard gillnet set in the Thousand Islands area of the St. Lawrence River, 1987-2007.

2.9 Juvenile Atlantic Salmon Electrofishing

Atlantic salmon were stocked in Cobourg Creek, Duffins Creek, and the Credit River as the central action of efforts to support the restoration of self-sustaining populations. To evaluate the success of this program, we electrofished Cobourg Creek and Duffins Creek to determine the relative abundance and survival of various Atlantic salmon life stages. Electrofishing for juvenile Atlantic salmon was conducted in October after most of the year's growth was complete, and when fish size indicates potential smolting.

On Cobourg Creek a more intensive survey was conducted as part of our partnership study of Atlantic salmon survival to smoltification with Trent University, Ontario Federation of Anglers and Hunters, and Aquatic Research and Development Section of OMNR. A total of 24 randomly selected sites were electrofished. While summary data are presented, data from individual sites on Cobourg Creek are not presented here as they are part of a graduate study and will be published later, after the thesis is complete. Sites on Cobourg Creek were located from the mouth up to Baltimore Creek, and in Baltimore Creek up to Ball's Mill. Sampling included locations where Atlantic salmon were and were not stocked. Nevertheless, Atlantic salmon were the fifth most abundant species caught in the study area of Cobourg Creek, after longnose dace, mottled sculpin, rainbow trout, and blacknose dace (Table 2.9.1).

A total of three randomly selected sites were electrofished on Duffins Creek, all at locations where Atlantic salmon were stocked. Atlantic salmon were the most abundant species caught at these sites (Table 2.9.1), followed by longnose dace. Density and biomass of Atlantic salmon and brook trout are indicated in Table 2.9.2.

TABLE 2.9.1. Mean catch and standard deviation (SD) of species of fish in Cobourg Creek and Duffins Creek during first electrofishing pass during surveys in 2007. Catch by site (DU21, DU22, DU23) is shown for Duffins Creek. YOY = young-of-the-year.

Species	Group	Cobourg Cr.		Duffins Cr.				
		Mean	SD	DU21	DU22	DU23	Mean	SD
Lamprey		1.63	5.84	0	1	6	2.33	3.21
Northern Brook Lamprey		0.38	1.13	0	0	0	0	0
Sea Lamprey		3.83	6.06	0	0	0	0	0
Chinook Salmon		0.46	1.25	0	0	0	0	0
Rainbow Trout	YOY	34.13	25.75	0	0	0	0	0
	Juvenile	11.13	9.39	0	0	0	0	0
	Lake run adult	0.13	0.45	0	0	0	0	0
Atlantic Salmon	YOY/Juvenile	19.63	41.83	31	35	31	32.33	2.31
Brown Trout	YOY	6.92	7.01	0	0	0	0	0
	Juvenile/adult	3.25	3.26	0	0	0	0	0
	Lake run adult	0.04	0.20	0	0	0	0	0
Brook Trout	YOY	0.08	0.28	1	4	4	3	1.7
	Juvenile/adult	0.42	0.97	8	2	3	4.333	3.2
White Sucker		14.29	25.56	0	0	9	3.00	5.20
Minnows		0.71	3.47	0	0	0	0	0
Northern Redbelly Dace		0.17	0.64	0	0	0	0	0
Common Shiner		0.21	1.02	0	0	0	0	0
Bluntnose Minnow		0.38	1.47	0	0	0	0	0
Fathead Minnow		0.21	0.72	0	0	0	0	0
Blacknose Dace		25.54	49.00	6	7	21	11.33	8.39
Longnose Dace		66.75	117.04	20	28	16	21.33	6.11
Creek Chub		1.92	4.14	0	0	2	0.67	1.15
Brook Stickleback		0.08	0.28	0	0	0	0	0
Pumpkinseed		0.04	0.20	0	0	0	0	0
Rainbow Darter		0	0	4	6	8	6.00	2.00
Fantail Darter		0.54	1.61	0	0	0	0	0
Johnny Darter		7.71	18.35	0	0	0	0	0
Mottled Sculpin		49.42	33.29	0	0	0	0	0

TABLE 2.9.2. Estimated density (No./m) and biomass (g/m^2) of Atlantic salmon and brook trout in Duffins Creek during electrofishing surveys in 2007. The abundance of young-of-the-year (YOY) salmonids was estimated for each species at each site using: N = catch + catch /(1/(1-0.2617*(mean weight)$^{0.27116}$)-1). For yearlings and older salmonids the population size was estimated according to Jones and Stockwell (1995)[1]. YOY = young-of-the-year. Latitude and longitude are recorded at the upstream end of site.

SITE	Latitude	Longitude	Date	Site width (m)	Site length (m)	Atlantic Salmon		Brook Trout				All	
						YOY		YOY		Juvenile/adult		All	
						No./m	g/m^2	No./m	g/m^2	No./m	g/m^2	No./m	g/m^2
DU21	43.9586°	-79.0793°	Oct 22, 2007	6.1	49.2	1.79	0.87	0.06	0.03	0.22	1.21	2.07	2.11
DU22	43.9571°	-79.0804°	Oct 22, 2007	5.7	51.0	1.88	1.12	0.21	0.13	0.04	0.22	2.14	1.47
DU23	43.9532°	-79.0820°	Oct22, 2007	6.5	49.0	1.46	1.44	0.24	0.10	0.07	0.21	1.77	1.76

[1] Jones, M.L. and J.D. Stockwell. 1995. A rapid assessment procedure for the numeration of salmonine populations in streams. N. Amer. J. Fish. Man. 15:551-562.

2.10 Credit River Chinook Assessment

Growth, condition and sea lamprey marking of Chinook salmon were monitored during the fall spawning run in the Credit River at the Reid Milling dam in Streetsville. Chinook salmon were electrofished in the Credit River for spawn collection by the Ringwood Fish Culture Station. LOMU crews measured fish for length and weight, and collected otoliths for age interpretation. The body condition of Chinook salmon in the Credit River was determined as the estimated mean weight of a 900 mm fish. Condition of male and female Chinook salmon in the Credit River declined in 2007 compared with 2006, and remains among the lowest observed since 1989 (Fig. 2.10.1). Length-at-age of Chinook salmon in the Credit River in 2007 was similar to 2006 but remains lower than the period from 1996 to 2003 (Fig. 2.10.2).

Sea lamprey marks on Chinook salmon in the Credit River has increased greatly over the past four years, and now exceeds the levels of 1977 (Fig. 2.10.3), before lamprey control measures were completely established in 1984.

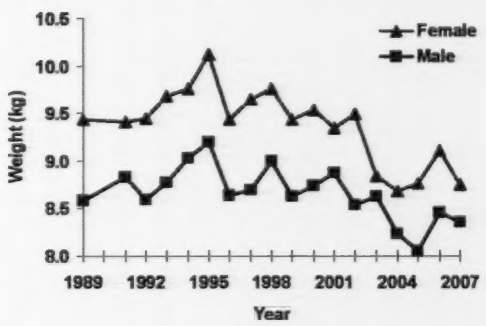

FIG. 2.10.1. Mean weight of a 900 mm Chinook salmon in the Credit River, 1989-2007, during the spawning run (approx. October 1).

[1]King, E.L., Jr. and T.A. Edsall. 1979. Illustrated field guide for the classification of sea lamprey attack marks on great lakes lake trout. G.L.F.C. Special Publication 79-1.

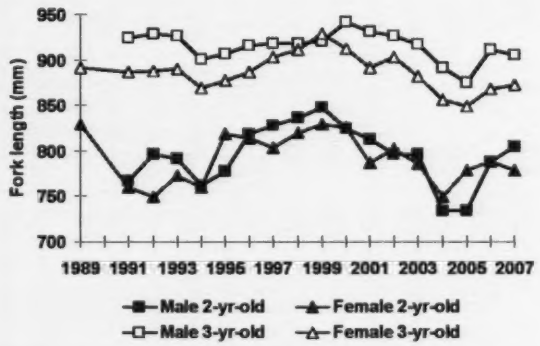

FIG. 2.10.2. Fork length of Chinook salmon in the Credit River, 1989-2007, during the spawning run (approx. October 1).

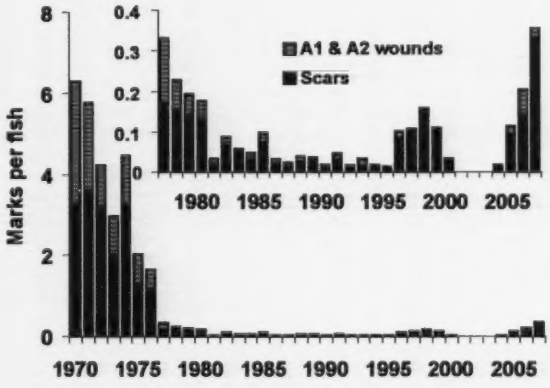

FIG. 2.10.3. Lamprey marking on Chinook and coho salmon during fall, 1970-2007, in the Credit River, Ontario. Since 1990, A1 and A2 marks[1] were called wounds and the remainder of marks were called scars to fit with historical classification.

3. Recreational Fishing Surveys

3.1 Bay of Quinte Recreational Fishery

The Bay of Quinte recreational fishery is an important and large scale winter and summer fishery focussed largely on walleye. Only the ice-fishing component of the Bay of Quinte recreational angling fishery was monitored in 2007; the open-water fishery was not surveyed. The ice-fishing survey was conducted from Trenton to just east of Glenora. Angling effort was measured using aerial counts while on-ice angler interviews provided information on catch/harvest rates and biological characteristics of the harvest.

Ice fishery

Ice formation was very late and ice-fishing activity was insignificant until late January. The 2007 ice-fishing monitoring was conducted using eleven aerial flights to count angler and ice-hut activity as well as four on-ice patrols to interview a total of 266 anglers. The maximum number of ice-huts counted during aerial flights was 323 huts (February 24); while the maximum number of on-ice anglers observed was 429 (February 28—the last day of the open fishing season). Forty-seven percent of anglers interviewed were local, 46% were from Ontario (outside local area), 5% were from the US and 1% was from elsewhere in Canada.

The survey estimated a total of 99,368 hours of ice-fishing effort, the highest since 2000, despite the short 2007 ice-fishing season. Anglers caught 17,480 walleye of which 11,313 were harvested; the most since 1999. Walleye fishing success rate this winter was high (Table 3.1.1 and Fig. 3.1.1). Most walleye caught were <480 mm fork length (Fig. 3.1.2); and of these, anglers released 44%. Very few walleye over 480 mm were released.

Anglers also caught an estimated 49,533 yellow perch of which 13,374 were harvested during the winter ice-fishery.

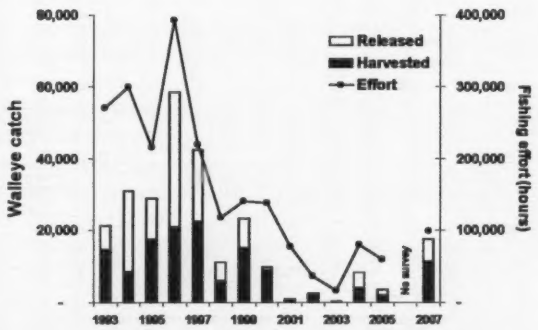

FIG. 3.1.1. Angling effort (anglers hours) by all anglers and walleye catch, harvest, CUE (fish caught per hour) and HUE (fish harvested per hour), 1993-2007, during the ice-fishery in the Bay of Quinte.

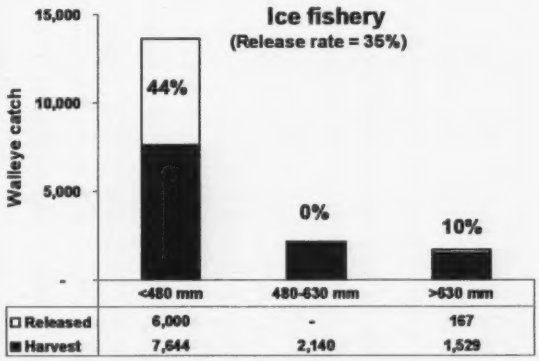

FIG. 3.1.2. Walleye catch by size category during the ice-fishery in the Bay of Quinte, 2007. Release rates are indicated.

TABLE 3.1.1. Angling effort (anglers hours) by all anglers and walleye catch, harvest, CUE (fish caught per hour) and HUE (fish harvested per hour), 1993-2007, during the ice-fishery in the Bay of Quinte.

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fishing Effort (angler hours):															
Total All Anglers	271,088	300,049	215,518	392,602	220,263	117,602	140,363	139,047	77,074	37,129	16,237	79,767	59,227		99,368
Number of Walleye:														No survey	
Caught	21,326	31,060	28,939	58,468	42,315	11,167	23,293	9,949	982	2,601	321	8,413	3,450		17,480
Harvested	14,816	8,557	17,445	20,972	22,631	6,089	15,285	9,240	938	2,468	70	4,075	1,947		11,313
Walleye Fishing Success:															
CUE	0.079	0.104	0.134	0.149	0.192	0.095	0.166	0.072	0.013	0.070	0.020	0.105	0.059		0.179
HUE	0.055	0.029	0.081	0.053	0.103	0.052	0.109	0.066	0.012	0.066	0.004	0.051	0.034		0.116

4. Commercial Fishery

4.1 Quota and Harvest Summary

Lake Ontario supports a locally important commercial fish industry. The commercial harvest comes primarily from the Canadian waters of Lake Ontario east of Brighton (including the Bay of Quinte) and the St. Lawrence River (Fig. 4.1.1). Commercial harvest statistics for 2007 were obtained from the Ontario Commercial Fisheries Association (OCFA) which, in partnership with the Ontario Ministry of Natural Resources, manages the Province of Ontario's commercial harvest database. Commercial quota and harvest statistics for Lake Ontario and the St. Lawrence River for 2007 are shown in Tables 4.1.1 (base quota), 4.1.2 (issued quota), and 4.1.3 (harvest).

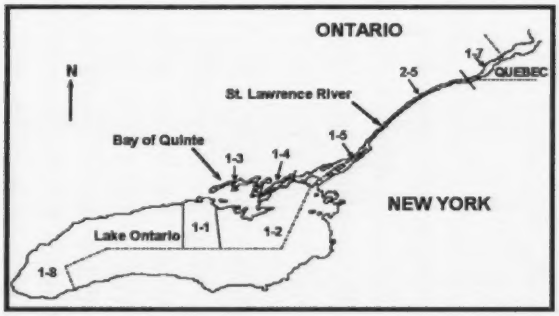

FIG. 4.1.1. Map of Lake Ontario and the St. Lawrence River showing commercial fishing quota zones in Canadian waters.

Lake Ontario

The total harvest of all species was 443,691 lb ($429,171) in 2007, down 136,047 lb (23%) from 2006 (Fig. 4.1.2, Table 4.1.4).

Lake whitefish

Lake whitefish harvest was 33,340 lb, 14% of base quota, and a decrease of 92,357 lb (73%) from the previous year. Seasonal whitefish harvest and biological attributes (e.g., size and age structure) information are reported in Section 4.2.

Yellow perch

Yellow perch harvest was 195,122 lb, 43% of the base quota, and a decrease of 27,487 lb (12%) from the previous year.

TABLE 4.1.1. Commercial fish base quota (lb) in the Canadian waters of Lake Ontario, 2007. See Fig. 1 for a map of the quota zones. Although there is also American eel base quota, commercial fishing for this species is currently closed, due to conservation considerations, and base quotas are not shown here.

	Base quota (lb) by quota zone										Quota by waterbody (lb)		
Species	1-1	1-2	1-3	1-4	1-8	1-5	2-5	1-7	East L.	West L.	Lake Ontario	St. Lawrence River	Total
Alewife	-	-	-	-	-	-	600	-	-	-	-	600	600
Black crappie	4,540	2,500	14,810	800	2,800	18,590	18,365	6,490	3,100	9,850	25,450	43,445	81,845
Bowfin	-	-	-	-	500	-	-	-	-	-	500	-	500
Brown bullhead	36,200	-	-	-	-	-	-	-	14,350	27,220	36,200	-	77,770
Common carp	-	-	1,000	-	-	-	-	-	-	-	1,000	-	1,000
Lake whitefish	14,545	152,032	31,719	40,615	416	-	-	-	-	-	239,327	-	239,327
Sunfish	28,130	-	-	-	-	-	-	-	14,600	18,080	28,130	-	60,810
Walleye	4,510	39,620	-	8,217	800	-	-	-	-	-	53,147	-	53,147
Yellow perch	35,589	182,508	96,128	126,170	13,000	66,676	83,174	7,680	1,400	4,420	453,395	157,530	616,745
Total	123,514	376,660	143,657	175,802	17,516	85,266	102,139	14,170	33,450	59,570	837,149	201,575	1,131,744

TABLE 4.1.2. Commercial fish issued quota (lb) in the Canadian waters of Lake Ontario, 2007. See Fig. 1 for a map of the quota zones.

	Issued quota (lb) by quota zone										Quota by waterbody (lb)		
Species	1-1	1-2	1-3	1-4	1-8	1-5	2-5	1-7	East L.	West L.	Lake Ontario	St. Lawrence River	Total
Alewife	-	-	-	-	-	-	300	-	-	-	-	300	300
Black crappie	2,270	1,250	20,895	400	1,400	8,965	9,183	4,070	3,100	9,850	26,215	22,218	61,383
Bowfin	-	-	-	-	250	-	-	-	-	-	250	-	250
Brown bullhead	18,100	-	-	-	-	-	-	-	14,350	27,220	18,100	-	59,670
Common carp	-	-	500	-	-	-	-	-	-	-	500	-	500
Lake whitefish	7,645	109,636	21,258	20,312	208	-	-	-	-	-	159,059	-	159,059
Sunfish	14,065	-	-	-	-	-	-	-	14,600	27,120	14,065	-	55,785
Walleye	2,756	18,390	-	15,609	400	-	-	-	-	-	37,155	-	37,155
Yellow perch	22,053	121,962	94,924	127,766	6,500	67,647	41,587	4,800	1,400	4,420	373,205	114,034	493,059
Total	66,889	251,238	137,577	164,087	8,758	76,612	51,070	8,870	33,450	68,610	628,549	136,552	867,161

TABLE 4.1.3. Commercial harvest (lb) and value ($) for fish species harvested in 2007 from the Canadian waters of Lake Ontario and the St. Lawrence River, as well as East and West Lakes (two Lake Ontario embayments). East and West Lake harvest data are not included in the Lake Ontario total harvest data. [1] Price per lb is a weighted average.

	Ontario, L.				St. Lawrence R.				East L.	West L.	Lake Ontario			St. Lawrence River		
Species	1-1	1-2	1-3	1-4	1-8	1-5	2-5	1-7	1	1	Harvest (lb)	Price-per-lb	Value	Harvest (lb)	Price-per-lb	Value
Black crappie	27	1	13,322	13	116	3,906	3,027	1,350	21	1,320	13,479	$ 2.60	$ 35,094	8,283	$ 2.80	$ 23,201
Bowfin	3,000	-	4,709	47	31	3,928	836	364	438	305	7,787	$ 0.34	$ 2,640	5,128	$ 0.47	$ 2,435
Brown bullhead	7,942	123	24,796	1,905	2,698	16,912	4,053	35,514	2,272	3,520	37,463	$ 0.31	$ 11,614	56,479	$ 0.31	$ 17,266
Channel catfish	-	-	-	-	339	-	-	-	-	-	339	$ 0.35	$ 119	-		$ -
Cisco	2	201	644	340	-	-	-	-	-	10	1,187	$ 0.28	$ 334	-		$ -
Common carp	167	796	2,496	568	3,469	3,033	-	-	184	-	7,496	$ 0.30	$ 2,217	3,033	$ 0.13	$ 409
Freshwater drum	7	1,104	12,530	5,282	4,344	13	-	-	-	14	23,267	$ 0.08	$ 1,815	13	$ 0.05	$ 1
Lake whitefish	137	24,718	6,389	2,096	-	-	-	-	-	-	33,340	$ 0.63	$ 21,032	-		$ -
Northern pike	5,776	3,760	24,657	2,713	330	10,077	-	-	1,590	1,421	37,236	$ 0.30	$ 11,057	10,077	$ 0.31	$ 3,125
Rock bass	1,836	2,208	6,134	1,509	165	1,977	462	-	2,585	2,146	11,852	$ 0.42	$ 5,019	2,438	$ 0.36	$ 887
Suckers	42	57	3,079	1,213	224	-	8	1,169	131	-	4,613	$ 0.11	$ 485	1,177	$ 0.13	$ 151
Sunfish	1,938	34	36,070	142	30	10,739	13,719	9,979	9,858	20,000	38,214	$ 0.79	$ 30,271	34,437	$ 0.95	$ 32,812
Walleye	427	3,970	-	10,452	148	-	-	-	-	-	14,997	$ 1.66	$ 24,958	-		$ -
White bass	-	5	-	102	29	2	-	-	-	-	136	$ 0.46	$ 63	2	$ 0.42	$ 1
White perch	2	156	12,256	4,483	266	919	-	-	21	3,432	17,163	$ 0.32	$ 5,411	919	$ 0.36	$ 330
Yellow perch	5,005	62,103	60,095	67,583	336	42,607	7,290	4,067	381	1,052	195,122	$ 1.42	$ 277,041	53,965	$ 1.50	$ 80,865
	26,308	99,236	207,177	98,446	12,524	94,113	29,395	52,443	17,480	33,218	443,691		$ 429,171	175,951		$ 161,484

TABLE 4.1.4. Commercial harvest (lb; 1960-2007) and landed value ($; 1985-2007) trends for the Canadian waters of Lake Ontario, including the Bay of Quinte.

	Harvest (lb)		Harvest (lb)	Value ($)
1960	1,834,000			
1961	2,026,000			
1962	1,620,000	1985	1,497,000	$ 906,879
1963	1,847,000	1986	1,759,000	$ 1,577,086
1964	1,814,000	1987	756,000	$ 993,609
1965	2,226,000	1988	1,190,000	$ 896,481
1966	1,347,000	1989	1,211,000	$ 989,563
1967	1,617,000	1990	1,165,000	$ 907,409
1968	1,829,000	1991	1,210,000	$ 1,003,909
1969	2,130,000	1992	1,191,000	$ 1,039,892
1970	2,798,000	1993	1,103,000	$ 746,892
1971	2,804,000	1994	1,243,097	$ 1,277,262
1972	2,455,000	1995	1,218,508	$ 1,322,557
1973	2,279,000	1996	1,284,022	$ 1,456,736
1974	2,299,000	1997	1,078,250	$ 996,383
1975	2,664,000	1998	973,006	$ 1,059,212
1976	2,935,000	1999	964,743	$ 1,067,904
1977	2,456,000	2000	914,014	$ 990,544
1978	2,469,000	2001	840,557	$ 861,978
1979	2,042,000	2002	602,338	$ 475,262
1980	1,982,000	2003	447,633	$ 324,320
1981	2,387,000	2004	404,236	$ 249,444
1982	1,999,000	2005	395,365	$ 310,084
1983	2,263,000	2006	579,738	$ 521,910
1984	2,050,000	2007	443,691	$ 429,171

Walleye

Walleye harvest was 14,997 lb, 28% of the base quota, and an increase of 3,794 lb (34%) from the previous year.

St. Lawrence River

The total harvest of all species was 175,951 lb ($161,484) in 2007 (Fig. 4.1.3, Table 4.1.5).

Yellow perch

Yellow perch harvest was 53,965 lb, 34% of base quota, an increase of 21,350 lb (65%) from the previous year.

TABLE 4.1.5. Commercial harvest (lb; 1988-2007) and landed value ($; 1989-1994 and 1996-2007) trends for the Canadian waters of the St. Lawrence River.

	Harvest (lb)	Value ($)
1988	318,000	
1989	273,800	$ 217,000
1990	305,100	$ 237,000
1991	247,600	$ 328,100
1992	292,700	$ 257,300
1993	237,000	$ 171,900
1994	262,240	$ 257,900
1995	375,763	
1996	445,052	$ 399,856
1997	353,838	$ 397,494
1998	378,729	$ 424,111
1999	368,035	$ 438,581
2000	341,672	$ 407,647
2001	272,523	$ 352,551
2002	266,817	$ 241,817
2003	211,254	$ 203,710
2004	143,845	$ 102,646
2005	221,294	$ 206,479
2006	230,201	$ 190,819
2007	175,951	$ 161,484

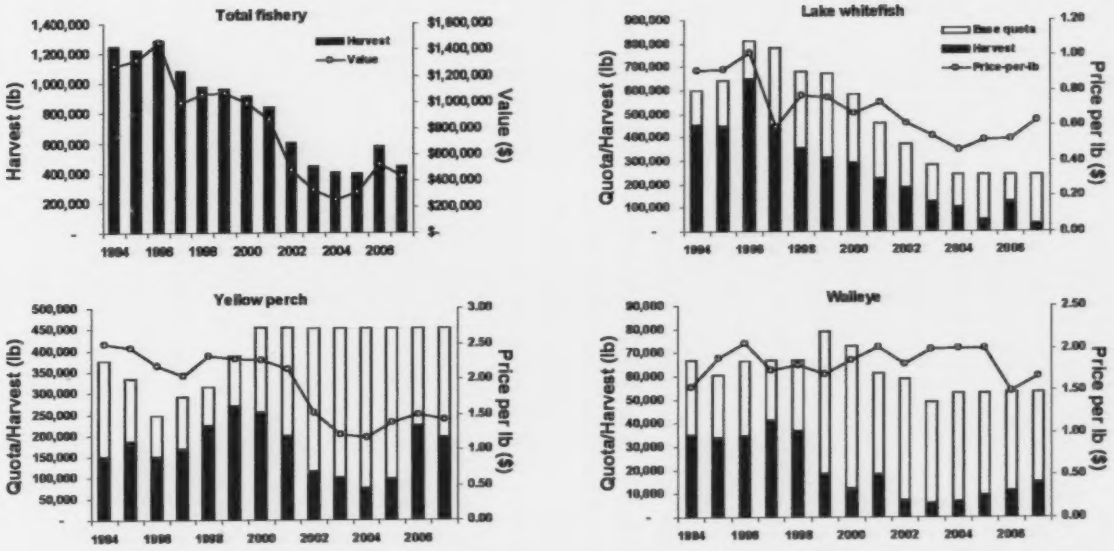

FIG. 4.1.2. Total harvest and value for the Lake Ontario commercial fishery and quota, harvest and price-per-lb for lake whitefish, yellow perch and walleye, 1994-2007.

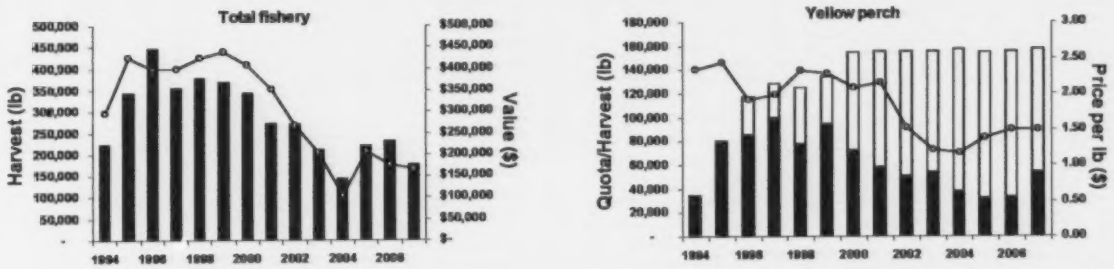

FIG. 4.1.3. Total harvest and value for the St. Lawrence River commercial fishery and quota, harvest and price-per-lb for yellow perch, 1994-2007.

4.2 Lake Whitefish Commercial Catch Sampling

Sampling of commercially harvested lake whitefish for biological attribute information occurs annually. While total lake whitefish harvest can be determined from commercial fish Daily Catch Reports (DCRs; see section 4.1), biological sampling of the catch is necessary to break-down total harvest into size and age-specific harvest. Age-specific harvest data can then be used in catch-age modeling to estimate population size and mortality schedule.

Commercial lake whitefish harvest and fishing effort by gear type, month and quota zone (QZ) for 2007 is reported in Table 4.2.1. Most of the harvest was taken in gillnets (77% by weight); 23% of the harvest was taken in impoundment gear. Gillnet fishing during November in QZ 1-2 accounted for 37% of the total harvest, for this gear type, and 25% of the effort). Significant harvest and effort also occurred in this QZ during the summer months. Most impoundment gear harvest and effort occurred in October and November in QZ 1-3 (Table 4.2.1).

Biological sampling focused on the November spawning-time gillnet fishery on the south shore of Prince Edward County (QZ 1-2) and the October/ November spawning-time impoundment gear fishery in the Bay of Quinte (QZ 1-3). The lake whitefish sampling design involves obtaining large numbers of length tally measurements and a smaller length-stratified sub-sample for more detailed biological sampling. Length tally measurements were obtained for both quota zones (Fig. 4.2.1 and Fig. 4.2.2) but a sample for detailed biological sampling, including for age, was obtained only from the Quote Zone 1-3 fishery. In total, fork length was measured for 736 fish and age was interpreted using otoliths for 158 fish (Table 4.2.2, Fig. 4.2.1 and 4.2.2).

Lake Ontario November Gillnet Fishery (QZ 1-2)

The mean fork length of lake whitefish harvested during the November gillnet fishery in Quota Zone 1-2 was 496 (Fig. 4.2.1).

Bay of Quinte November Impoundment Gear Fishery (QZ 1-3)

Mean fork length and age were 486 mm and 11.8 years, respectively (Fig. 4.2.2). Fish ranged from ages 4 to 21 years. Age-16 (1991 year-class) fish were the most abundant followed by age-8 fish (1999 year-class). This represents the fourteenth consecutive year that the 1991 year-class was the most common year-class in the Quota Zone 1-3 commercial harvest (ranging from 22-62% of the harvest during the 14-year time period).

TABLE 4.2.1. Lake whitefish harvest (lb) and fishing effort (yards of gillnet or number of impoundment nets) by gear type, month and quota zone. Harvest and effort value in bold italic represent months and quota zones where whitefish biological samples were collected. No detailed biological sample (i.e. lengths only, no ages) was collected for the gillnet fishery in 2007.

		Harvest (lb)					Effort (yards or number of nets)			
Gear type	Month	1-1	1-2	1-3	1-4	Month	1-1	1-2	1-3	1-4
Gillnet	Jan	-	-	-	29	Jan	-	-	-	840
	Feb	-	-	-	22	Feb	-	-	-	100
	Mar	-	-	-	28	Mar	-	-	-	400
	Apr	-	1,131	-	-	Apr	-	5,800	-	-
	May	-	3,618	-	-	May	-	19,550	-	-
	Jun	-	312	-	-	Jun	-	5,080	-	-
	Jul	-	1,101	-	-	Jul	-	13,000	-	-
	Aug	-	120	-	-	Aug	-	1,120	-	-
	Sep	-	2,756	-	1,859	Sep	-	5,700	-	11,590
	Oct	-	3,501	-	5	Oct	-	10,400	-	1,600
	Nov	53	9,585	-	-	Nov	3,000	30,630	-	-
	Dec	-	1,625	-	90	Dec	-	9,600	-	2,200
Impoundment	Apr	-	-	30	23	Apr	-	-	78	2
	May	-	551	19	30	May	-	25	45	5
	Jun	-	85	-	-	Jun	-	20	-	-
	Jul	-	-	-	2	Jul	-	-	-	1
	Oct	10	30	904	-	Oct	5	2	235	-
	Nov	74	304	***5,432***	13	Nov	15	7	***563***	1

TABLE 4.2.2. Age-specific vital statistics of lake whitefish sampled and harvested including number aged, number lengthed[1] (determined by age-length key), and proportion by number of fish sampled, harvest by weight (kg) and number, and mean weight (kg) and fork length (mm) of the harvest for Quota Zone 1-3. No biological sample was available for Quota Zone 1-2.

	Quota zone 1-3						
	Sampled			Harvested			
Age (years)	Number aged	Number lengthed[1]	Prop.	Number	Weight (kg)	Mean weight (kg)	Mean length (mm)
1	-	-	0.000	-	-		
2	-	-	0.000	-	-		
3	-	-	0.000	-	-		
4	1	2	0.005	10	10	1.009	452
5	5	18	0.037	81	81	1.001	443
6	3	6	0.013	27	26	0.959	441
7	9	31	0.063	138	148	1.072	450
8	19	70	0.143	312	338	1.084	457
9	16	49	0.100	218	249	1.142	465
10	11	36	0.074	161	194	1.206	472
11	1	8	0.016	36	38	1.073	572
12	12	40	0.081	176	233	1.327	488
13	13	32	0.065	141	193	1.371	490
14	10	28	0.058	125	188	1.501	507
15	9	28	0.058	126	194	1.536	507
16	44	127	0.258	562	902	1.605	517
17	1	5	0.009	20	24	1.194	487
18	-	-	0.000	-	-		
19	1	3	0.005	12	24	2.055	580
20	2	5	0.011	24	40	1.713	541
21	1	2	0.004	8	13	1.705	561
22	-	-	0.000	-	-		
Total	158	490	1.000	2,176	2,897		
Weighted mean						1.331	

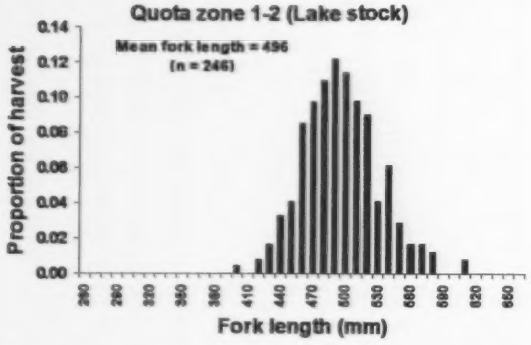

FIG. 4.2.1. Size distribution (by number) of lake whitefish sampled in QZ 1-2 during the 2007 commercial catch sampling program.

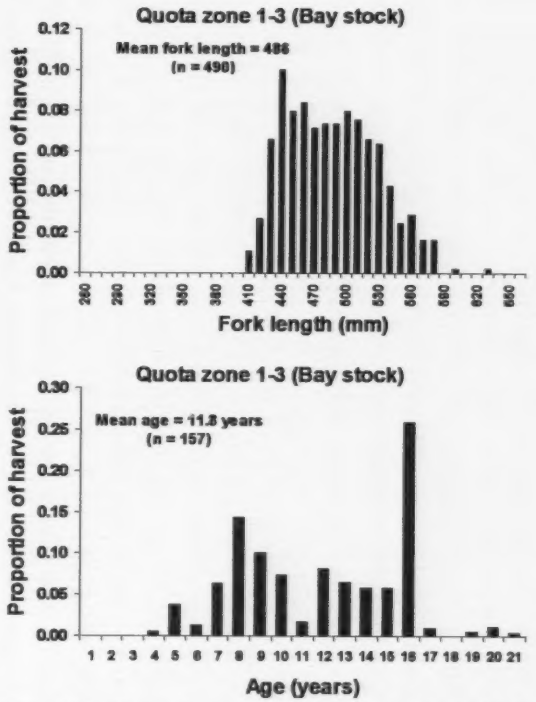

FIG. 4.2.2. Size and age distribution (by number) of lake whitefish sampled in QZ 1-3 during the 2007 commercial catch sampling program.

Condition

Lake whitefish (Lake Ontario and Bay of Quinte spawning stocks and sexes combined) condition (lb) standardized for a fish of total length 21 inches (480 mm fork length) is shown in Figure 4.2.3. Condition declined markedly in 1994 and has remained low.

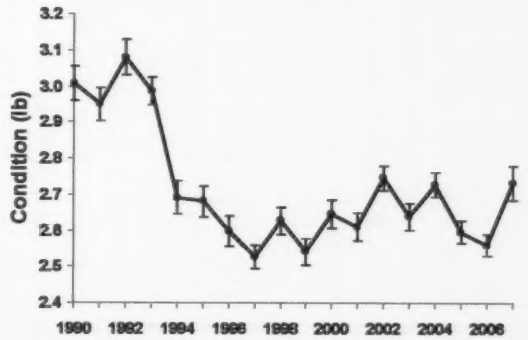

FIG. 4.2.3. Lake whitefish (Lake Ontario and Bay of Quinte spawning stocks and sexes combined) condition (lb) standardized for a fish of total length 21 inches (480 mm fork length), 1990-2006.

5. Age & Growth Summary

Biological sampling of fish from Lake Ontario Management Unit field projects routinely involves collection and archival of structures used for such purposes as age interpretation and validation, origin determination (e.g. stocked versus wild), life history characteristics and other features of fish growth. In 2007, a total of 8,754 structures were collected and 3,104 were processed for age interpretation from 32 different fish species and 14 different field projects (Table 5.1) .

TABLE 5.1. Species-specific summary of age and growth structures collected/archived (n = 8,754) and interpreted for age (3,104) in support of 14 different Lake Ontario Management Unit field projects, 2007.

	Scales		Otoliths		Cleithra		Operoula		Spines	
	Collected / archived	Interpreted for age	Collected / archived	Interpreted for age	Collected / archived	Interpreted for age	Collected / archived	Interpreted for age	Collected / archived	Interpreted for age
Alewife	-	-	165	-	-	-	-	-	-	-
Gizzard shad	6	-	-	-	-	-	-	-	-	-
Chinook salmon	27	-	133	107	-	-	-	-	-	-
Rainbow trout	208	100	2	-	-	-	-	-	-	-
Brown trout	19	-	16	-	-	-	-	-	-	-
Lake trout	209	-	207	-	-	-	-	-	-	-
Lake whitefish	270	53	278	272	-	-	-	-	-	-
Cisco (Lake herring)	25	-	25	-	-	-	-	-	-	-
Round whitefish	20	-	20	-	-	-	-	-	-	-
Rainbow smelt	-	-	144	-	-	-	-	-	-	-
Northern pike	199	-	-	-	199	195	-	-	-	-
White sucker	-	-	-	-	-	-	107	-	-	-
Lake chub	1	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	-	-	-	-	-	-	78	-
Channel catfish	-	-	-	-	-	-	-	-	32	-
American eel	-	-	246	12	-	-	-	-	-	-
Burbot	-	-	1	-	-	-	-	-	-	-
Trout-perch	1	-	111	-	-	-	-	-	-	-
White perch	359	-	-	-	-	-	-	-	-	-
White bass	19	-	-	-	-	-	-	-	-	-
Rock bass	244	-	-	-	-	-	-	-	-	-
Pumpkinseed	203	159	-	-	-	-	-	-	-	-
Bluegill	190	157	-	-	-	-	-	-	-	-
Smallmouth bass	298	294	1	-	-	-	-	-	-	-
Largemouth bass	150	118	30	-	-	-	30	-	-	-
Black crappie	135	96	-	-	-	-	-	-	-	-
Yellow perch	1,464	461	335	351	-	-	-	-	-	-
Walleye	778	29	755	568	-	-	-	-	-	-
Round goby	-	-	78	-	-	-	-	-	-	-
Freshwater drum	407	-	472	126	-	-	-	-	-	-
Slimy sculpin	-	-	51	-	-	-	-	-	-	-
Deepwater sculpin	-	-	6	6	-	-	-	-	-	-
Total	5,232	1,467	3,076	1,442	199	195	137	-	110	-

6. Contaminant Monitoring

Lake Ontario Management Unit cooperates annually with several agencies to collect fish samples for contaminant testing. In 2007, 628 contaminant samples were collected for the Ministry of the Environment and Energy's (MOEE) Sport Fish Monitoring program (Table 6.1.). Samples were primarily collected using existing fisheries assessment programs on Lake Ontario, Bay of Quinte, St. Lawrence River, Ganaraska River, East Lake and West Lake.

A summary of the number of fish samples collected, by species, for contaminant analysis by the Ministry of Environment and Energy (MOEE), 2001-2007 is shown in Table 6.2.

TABLE 6.1. Number of fish samples collected, by region and species, for contaminant analysis by the Ministry of Environment and Energy (MOEE), 2007.

Region	Species	Number of samples
Northwestern Lake Ontario	Chinook salmon	1
	Lake trout	17
	Brown trout	6
Ganaraska River	Rainbow trout	20
Upper Bay of Quinte	Black crappie	20
	Brown bullhead	20
	Northern pike	14
	Pumpkinseed	20
	Rock bass	10
	Smallmouth bass	2
	Walleye	20
	White perch	20
	Yellow perch	20
	Largemouth bass	20
Middle Bay of Quinte	Freshwater drum	2
	Smallmouth bass	1
	Walleye	16
	Yellow perch	16
Thousand Islands	Brown bullhead	20
	Northern pike	20
	Pumpkinseed	3
	Rock bass	20
	Smallmouth bass	20
	Walleye	20
	Yellow perch	20
	Largemouth bass	18
Toronto Waterfront Area	Northern pike	20
	Pumpkinseed	15
	Walleye	2
	Yellow perch	20
	Largemouth bass	14
East Lake	Northern pike	20
	Pumpkinseed	20
	Walleye	20
	Yellow perch	6
	Largemouth bass	20
West Lake	Northern pike	20
	Walleye	20
	Yellow perch	8
	Largemouth bass	17
	Pumpkinseed	20

TABLE 6.2. Summary of the number of fish samples collected, by species, for contaminant analysis by the Ministry of Environment and Energy (MOEE), 2001-2007.

	Year							
Species	2000	2001	2002	2003	2004	2005	2006	2007
Black crappie			20	20	3	20		20
Bluegill		26		20	10	23		
Brown bullhead		40	44	40	25	30	33	40
Brown trout	40	3	20		31		22	6
Channel catfish	20	20	7	23		17		
Chinook salmon	40	3	16		48		29	1
Coho salmon		1	3					
Common carp				7				
Freshwater drum			43		16		13	2
Lake trout			42		54		38	17
Lake whitefish	20							
Largemouth bass		4	25	28	20	9	8	89
Northern pike		53	39	60	22	40	22	94
Pumpkinseed		60	25	57	8	11	23	78
Rainbow trout	40	37	28	20	37	20	29	20
Rock bass		36	30	38	11	21	27	30
Silver redhorse							1	
Smallmouth bass		20	87	22	21	28	35	23
Walleye		42	51	40	61	30	62	98
White perch		40		40	40	14	21	20
White sucker							1	
Yellow perch	20	60	66	58	75	40	86	90
Total	180	445	546	473	482	303	450	628

7. Management Activities

7.1 Stocking

During 2007, OMNR stocked about 1.7 million salmon and trout into Lake Ontario (Table 7.1.1). Figure 7.1.1 shows stocking trends in Ontario waters from 1968-2007. The New York State Department of Environmental Conservation (NYSDEC) also stocked 3.6 million salmon and trout into the lake in 2007.

About 500,000 Chinook salmon spring fingerlings were stocked at various locations to provide put-grow-and-take fishing opportunities. Of these, about 20,000 were held in pens at two embayment sites in eastern Lake Ontario for a short period of time prior to stocking. This ongoing project is being done in partnership with a local community group to determine whether these fish successfully imprint on the embayments. It is hoped that pen-imprinting will help improve returns of mature adults to this area in the fall, thereby enhancing local nearshore and shore fishing opportunities. Follow-up monitoring continued through the use of angler diaries.

Atlantic salmon were stocked in support of an ongoing program to restore self-sustaining populations of this native species to the Lake Ontario basin (see Section 7.3). Over 280,000 advanced fry and 50,000 spring yearlings were released into the Credit River, Duffins Creek and Cobourg Brook. A power interruption at OMNR's Normandale Fish Culture Station significantly reduced the number of fish available for stocking as fall fingerlings in 2007. These three streams were selected as a focus for restoration because of their abundance of spawning and nursery habitat and strong community interest in the program. OMNR is working cooperatively with a network of partners to plan and deliver this phase of Atlantic salmon restoration, including setting new stocking targets to help meet program objectives. Atlantic salmon are produced at both OMNR and partner facilities. The Atlantic salmon broodstock is currently housed at OMNR's Harwood Fish Culture Station.

Almost 450,000 lake trout yearlings were also stocked as part of an established, long-term rehabilitation program. Lake trout stocking is focused in eastern Lake Ontario where most of the historic spawning shoals are found.

Rainbow trout and brown trout were stocked at various locations to provide shore and boat fishing opportunities. A portion of the rainbow trout target is stocked into streams with a potential to establish wild populations. About 80,000 surplus brown trout were stocked as fall fingerlings in 2007 to enhance shore fisheries.

Almost 300,000 young American eel were stocked into the upper St. Lawrence River, as a short-term measure to offset mortalities experienced in hydro electric generation turbines during downstream migration. This is part of a broad, bi-national, multi-agency effort to reverse the serious decline in abundance of this globally significant species.

OMNR remains committed to providing diverse fisheries (and the associated benefits) in Lake Ontario and its tributaries, based on wild and stocked fish, as appropriate. OMNR is committed also to restoration of native species and supports efforts to maintain / restore healthy, stable Lake Ontario fish communities.

Detailed information about OMNR's 2007 stocking activities is found in Appendix C.

TABLE 7.1.1. American eel, salmon and trout stocked into Province of Ontario waters of Lake Ontario, 2007, and target for 2008.

		Number Stocked	
Species		**2007**	**2008 target**
American eel		**294,300**	**3,000,000**
Atlantic salmon	Fry	280,282	400,000
	Fall fingerlings	16,441	197,500
	Spring yearlings	54,652	50,000
	Sub-adults	863	0
		352,238	**597,500**
Brown trout	Fall fingerlings	81,079	
	Spring yearlings	170,211	**165,000**
		251,290	
Chinook salmon	Spring fingerlings	**501,356**	**540,000**
Coho salmon	Fall fingerlings	**0**	**50,000**
Lake trout	Spring yearlings	**448,080**	**440,000**
Rainbow trout	Fry	12,500	
	Fall fingerlings	11,735	
	Spring yearlings	139,537	140,000
		163,772	**140,000**
Stocking totals		**2,011,036**	**4,717,500**

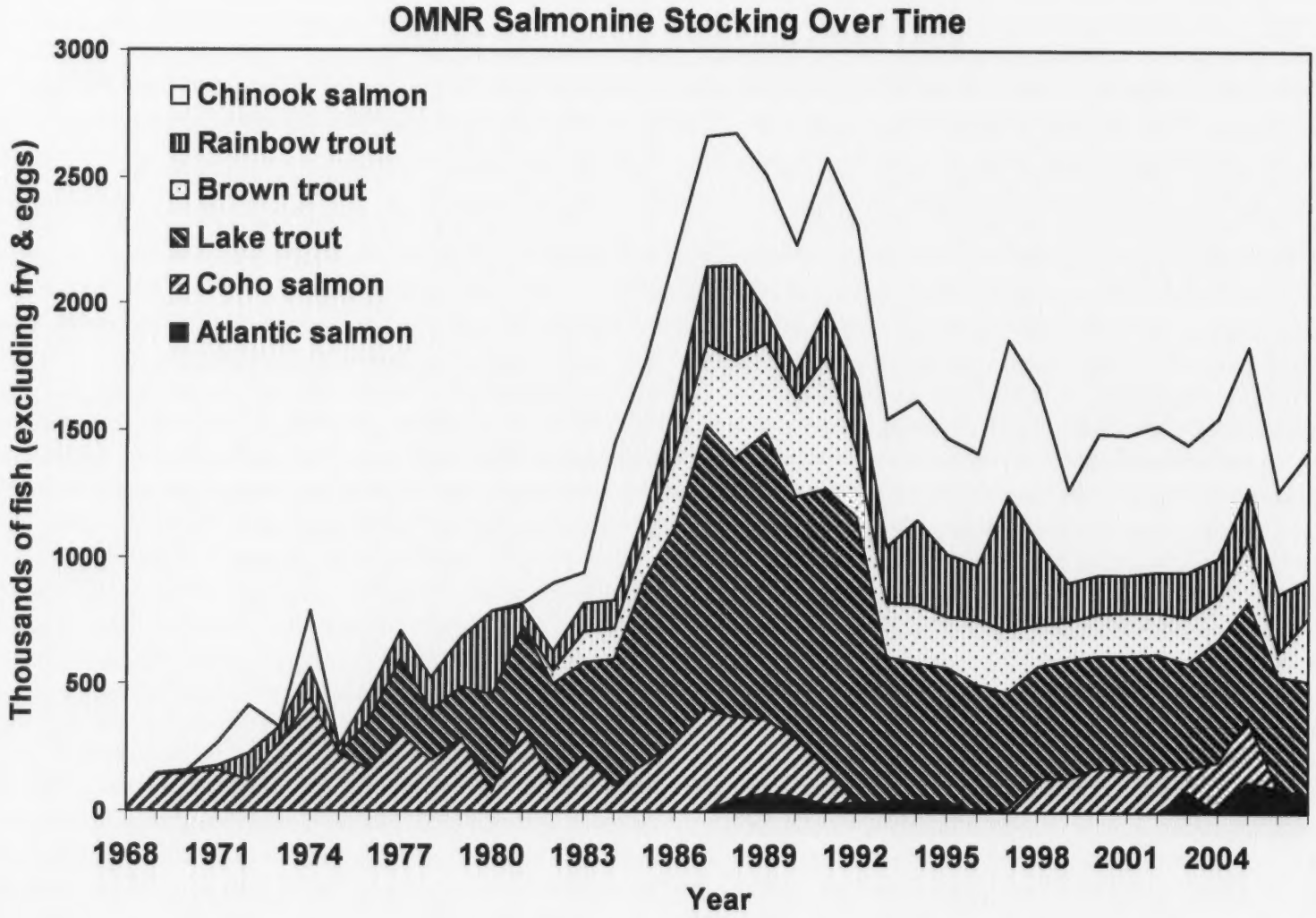

FIG. 7.1.1. Trends in salmon and trout stocking in Ontario waters of Lake Ontario, 1968-2007.

7.2 Fisheries Management Plans

Lake St. Francis Fisheries Management Plan

A Fisheries Management Plan (FMP) was completed for Lake St. Francis in 2007. The FMP outlines values and concerns expressed by the public, MNR, and other agencies, groups, and stakeholders and provides management strategies to help guide fisheries management over the next five years. Concurrently with FMP development, a Fish Habitat Management Plan (FHMP) is being written by the Raisin Region Conservation Authority. The FHMP will form an important component of the FMP, and overall management of Lake St. Francis. The FHMP is being developed in order to address concerns identified by the International Joint Commission (IJC) at the Cornwall Area of Concern (AOC).

Plan implementation is underway with a trapnetting survey having been completed in 2007 (NSCIN; see Section 2.7), and monitoring wetland restoration efforts, development of a walleye management plan as well as creel, index gillnetting and nearshore trapnetting surveys scheduled for the 2008 field season.

Bay of Quinte Fisheries Management Plan

The Ministry of Natural Resources along with multi-agency government and stakeholder partners is finalizing a fisheries management plan for the Bay of Quinte (BQFMP). The plan will focus on the sustainable use of the fish communities in the Bay of Quinte and improving communications among government agencies and stakeholders by providing a framework for coordinated and cooperative management. The BQFMP will provide direction for the management of the fisheries resource in the Bay of Quinte for a period of five years.

The draft BQFMP integrates well with the goals and recommendations outlined in both the Remedial Action Plan (RAP) for the Bay of Quinte and the Bay of Quinte Fish Habitat Management Plan (BQFHMP). Highlights from the draft BQFMP include plans to:

- Continue monitoring fish populations and monitor effectiveness of new regulations,
- Establish stakeholder partnerships (recreational, commercial and First Nations) to enhance sustainable management the Bay of Quinte fishery,
- Enhance enforcement efforts on the Bay of Quinte, and
- Increasing education and communication efforts with the public.

Next Steps

Public response will be solicited during another open house scheduled for March 2008. Further public response will be obtained following posting of the plan on the Environmental Bill of Rights website in spring 2008. A completed plan is expected by summer 2008.

Establishment of a Lake Ontario Fisheries Management Zone 20 Advisory Council

The province of Ontario has proposed a new ecological framework for recreational fisheries management in Ontario to ensure resource sustainability and to optimize angling opportunities. This approach is consistent with the Ministry of Natural Resources (MNR) strategic direction outlined in "Our Sustainable Future" and with the policy principles stated in the Strategic Plan for Ontario Fisheries (SPOF and SPOF II).

The new ecological framework focuses on:

- creating new fisheries management zones (FMZ) based on biological, climatic, and social factors in order to provide a sound framework for fisheries management,
- developing regulatory "tool kits" for different sport fish species to establish broad, zone-wide standards and ensure regulations are based on sound science,
- monitoring fisheries in a standardized fashion to engage an adaptive management approach and to enable state of the resource reporting, and
- enhancing public input and involvement through creation of stewardship councils in each fisheries management zone.

Fisheries Management Zone 20 replaces former recreational fishing divisions 8, 11 and 12a.

To enhance public involvement in the management of Ontario's fisheries, the province is setting up stakeholder-based FMZ councils. An initial set of pilot councils was established in 2007 and an FMZ council is proposed for Zone 20 in 2008. The establishment of FMZ Advisory Councils for each FMZ in Ontario is an important step forward in implementing the new Ecological Framework for Recreational Fisheries Management. Public involvement in fisheries

management will be enhanced through the FMZ Advisory Councils. Along with the existing stewardship initiatives (e.g., Ontario Stewardship and lake-based stewardship councils), the FMZ Advisory Councils will be a key vehicle for achieving enhanced stewardship within each of the FMZs. The purpose of the FMZ 20 Advisory Council will be to provide advice to the lead FMZ manager and other responsible MNR managers concerning recreational fisheries management within the zone.

Hamilton Harbour Fisheries Management Plan

The MNR and Royal Botanical Gardens are developing a Fisheries Management Plan for Hamilton Harbour and its watershed (HHFMP) in partnership with the federal and municipal governments, Hamilton and Halton Region Conservation Authorities, several regional conservation groups and a number of local stakeholders, all of which are represented in the Steering Committee, Science and Technical Committee, or Anglers Working Group. The HHFMP will provide direction for the management of the fisheries resource in Hamilton Harbour and its watersheds.

Comments on the first draft of the HHFMP from the Steering and Technical Committees, and the Anglers Working Group were used for revision. A second draft of the HHFMP was sent out for review by these committees in February 2008. The draft HHFMP integrates well with the Remedial Action Plan (RAP) for Hamilton Harbour, by incorporating and building on many of the goals, recommendations, and targets of the RAP. Highlights from the draft HHFMP include plans to:

- mitigate the impacts of barriers to fish migration on several Hamilton Harbour tributaries,
- restore shoal habitats for spawning and living space for warmwater and coldwater fish communities (e.g., smallmouth bass, walleye, yellow perch, lake herring, lake whitefish), and
- restore cisco populations to Hamilton Harbour and western Lake Ontario.

Comments, on the draft plan are being incorporated, and public review will be conducted on the Environmental Bill of Rights website in spring 2008. A completed plan is expected by summer 2008.

7.3 Native Species Restoration

MNR works with many partners—government agencies, non-government organizations and interested individuals—at local, provincial and national levels, to monitor, protect and restore the biological diversity of fish species in the Lake Ontario basin (including the lower Niagara River and the St. Lawrence River downstream to the Quebec-Ontario boarder).

Table 7.3.1 lists twenty-two fish species that formerly occurred or are currently 'rare' in the Lake Ontario basin. Three of these species, blackfin cisco (note that there is debate about historic existence of blackfin cisco in Lake Ontario), blue pike (a sub-species of walleye), and Lake Ontario kiyi are thought to be extinct. Four species, Atlantic salmon, bloater, lake trout and shortnose cisco have been extirpated from the Lake Ontario basin (local extinction). Four species, American eel, burbot, deepwater sculpin and lake sturgeon that were once very common in the basin are now considered to be rare. The remaining species on this list were either uncommon historically or their historic status is uncertain. In addition, we acknowledge that there may be other species (e.g., small cyprinids for example) that may have been present historically but were lost prior to their documentation of their presence in the basin.

The sections below describe the efforts to restore lake trout, Atlantic salmon, and American eel. In addition, restoration plans for lake sturgeon and deepwater ciscoes in Lake Ontario are in the initial stages of development.

Observations of rare fish species in the Lake Ontario and its tributaries during 2007 included:

- Pugnose shiner (160 specimens); captured at 12 sites in upper St. Lawrence River (see Section 9.2),
- Spotted gar; one specimen captured in East Lake, and
- River redhorse; four specimens captured in the upper Bay of Quinte (see Section 2.7).

Lake trout

A revision of the plan to rehabilitate lake trout in Lake Ontario is nearing completion and we expect it to be formally adopted in 2008. The rehabilitation of lake trout in Lake Ontario began in the 1970s with sea lamprey control, and stocking of hatchery fish. The first formal plan outlining the objectives and strategies for the rehabilitation efforts was formulated in 1983,

Table 7.3.1. Status of 'rare' fishes in the Lake Ontario basin and their designation (as of December 31, 2007) under the Ontario Endangered Species Act at Risk (ESA 2007; note that the actual legislation in not in force until Jun 30, 2008) and the Canadian Species at Risk Act (SARA).

Name	Status in Lake Ontario Basin	ESA 2007 Designation	SARA Designation
American Eel, *Anguilla rostrata*	Historically very abundant throughout the nearshore zone of the basin; now rare.	Endangered	proposed as Special Concern Pending public consultation
Atlantic Salmon (Lake Ontario population), *Salmo salar*	Historically abundant throughout Lake Ontario and major tributaries; extirpated prior to 1900's; restoration efforts underway.	Extirpated	proposed as Extirpated, pending public consultation
Bigmouth Buffalo, *Ictiobus cyprinellus*	Rare historic observations; one recent observation in Lake Ontario.	Special Concern	Special Concern
Black Redhorse, *Moxostoma duquesnei*	Historic abundance unclear; currently found at low abundance in Spencer Creek.	Threatened	Threatened
Blackfin cisco, *Coregonus nigripinnis*	Historically abundance in offshore pelagic zone is unclear; thought to have become extinct by 1900.		Data Deficient
Bloater, *Coregonus hoyi*	Historically abundant in offshore pelagic zone; extirpated; last recorded in 1983.		Not at Risk
Blue Pike, *Sander vitreus glaucus*	Historically abundant in western Lake Ontario and Niagara River; extinct prior to 1970's.		Extinct
Bridle Shiner, *Notropis bifrenatus*	Historic abundance unclear; currently at low abundance in upper St. Lawrence River and tributaries, as well as Napanee River and Bay of Quinte	Special Concern	Special Concern
Burbot, *Lota lota*	Abundant in the offshore zone up to the 1920; declined steadily to virtual extirpation by about 1950; now rare.		
Channel Darter, *Percina copelandi*	Historic abundance unclear but occurred in the upper St. Lawrence River; currently found at low abundance in Moira River (including the Skootamatta River) and Salmon River.	Threatened	Threatened
Cutlip Minnow, *Exoglossum maxillingua*	Historic abundance unclear; currently at low abundance in St. Lawrence River and tributaries.	Threatened	Not at Risk
Deepwater Sculpin (Great Lakes population), *Myoxocephalus thompsonii*	Historically very abundant in offshore pelagic zone; currently rare.		Special Concern
Grass Pickerel, *Esox americanus vermiculatus*	Historic abundance unclear; currently in low abundance in St. Lawrence River, Lake Consecon, Wellers Bay.	Special Concern	Special Concern
Lake Ontario Kiyi, *Coregonus kiyi orientalis*	Historically abundant in offshore pelagic zone; extinct; last recorded in 1964.		Extinct
Lake Sturgeon (Great Lakes and Western St. Lawrence populations), *Acipenser fulvescens*	Common in the nearshore zone and large tributaries throughout the basin prior to 1900; now rare.	Special Concern	proposed as Threatened pending public consultation
Lake trout, *Salvelinus namaycush*	The most abundant piscivore in the offshore zone up to the 1920s; Declined steadily to virtual extirpation by about 1950; Restoration efforts underway.		
Pugnose Shiner, *Notropis anogenus*	Historic abundance is unclear; Currently at low abundance in Thousand Islands area of St. Lawrence River.	Endangered	Endangered
Redside Dace, *Clinostomus elongatus*	Historic abundance unclear, but occurred in tributaries from Oshawa to Hamilton; Currently rare.	Threatened	Endangered
River Redhorse, *Moxostoma carinatum*	Historic abundance unclear; Currently at low abundance in Bay of Quinte and Trent River.	Special Concern	Special Concern
Shortnose Cisco, *Coregonus reighardi*	Historically abundant in offshore pelagic zone; Extirpated; Last recorded in 1964.	Endangered	Endangered
Silver Shiner, *Notropis photogenis*	Historic abundance unclear; Currently at low abundance in Bronte Creek.	Special Concern	Special Concern
Spotted Gar, *Lepisosteus oculatus*	Limited historic abundance in sheltered nearshore zone; Two recent observations in Bay of Quinte and East Lake.	Threatened	Threatened

and revisions in 1990 and 1997 were made to evaluate the methodology and the progress of rehabilitation.

The current revision comes at a time when we saw promising signs in the form of naturally produced lake trout, but also experienced setbacks in survival of stocked hatchery juveniles, and declining numbers of mature fish. The rehabilitation plan reaffirms the core strategies of stocking and protection of stocked fish (sea lamprey and harvest control), but it also identifies the reduced survival of stocked juveniles as a key issue to be addressed. Ecosystem impediments to restoration, and strategies to mitigate them are recommended including efforts to introduce and restore native prey species.

Atlantic salmon

Atlantic salmon were extirpated from Lake Ontario by the late 1800s, primarily as a result of the loss of spawning and nursery habitat in streams. They were a valued resource for First Nations communities and early European settlers. As a top predator, they played a key ecological role in the offshore fish community. Atlantic salmon are recognized as an important part Ontario's natural and cultural heritage. Restoring a native species like Atlantic salmon would be a significant milestone in improving Ontario's biodiversity.

A significant partnership has been established to advance restoration of Atlantic salmon to Lake Ontario. This partnership, initiated in 2006, brings together the Ministry of Natural Resources, the Ontario Federation of Anglers and Hunters (OFAH), Australia's Banrock Station wine company and the Liquor Control Board of Ontario (LCBO). The LCBO has adopted Atlantic salmon as the "flagship" species for its Natural Heritage Fund, established to protect Ontario's natural heritage by preserving and expanding wildlife habitat. Banrock supports conservation projects world-wide and has a presence here through the Banrock Station Wetland Foundation Canada.

OFAH has also engaged a long list of dedicated, conservation-minded groups in this project. Other partners and sponsors include the Canadian Sportfishing Industry Association, Trout Unlimited Canada, Fleming College, Trees Ontario Foundation, Fishing Forever Foundation, the World Fishing Network as well as local conservation authorities and community groups.

Progress was made on updating our existing Atlantic salmon restoration plan, including the development of action plans for:

- fish production,
- community involvement,
- research and assessment priorities, and
- habitat enhancement.

Restoration is focused on three "best-bet" streams—the Credit River, Duffins Creek and Cobourg Creek. These systems offer good quality spawning and nursery habitat for Atlantic salmon and strong community support. Other suitable streams may be considered for restoration in the future. We aim to increase stocking levels to allow us to meet restoration targets in the selected streams, and more effectively assess the rate of adult returns and production of wild juveniles. Fall surveys showed that spring-stocked fry were growing and surviving well in all three streams (see Section 2.9).

We have designed a study to compare stocking of various life stages of Atlantic salmon (fry, fall fingerlings and yearlings) to determine which is most effective for the purpose of restoration. Genetic profiles have been developed for each individual brood fish in the hatchery to help us track their progeny in the streams and in the lake. To complement the existing broodstock, which originated from the LaHave River (Nova Scotia), we plan to introduce two additional Atlantic salmon stocks with desirable characteristics for restoration. Hatchery broodstocks will be developed and the performance of their progeny will be evaluated. Two broodstocks from landlocked populations in Sebago Lake (Maine) and Lac St-Jean (PQ) are currently under development at OMNR hatcheries. Performance of Atlantic salmon in the lake phase of their life cycle will be an important component of our assessment program, particularly in light of the dramatic changes to the Lake Ontario ecosystem in recent years. Efforts to address other potential challenges to restoration will continue.

American Eel

The number of eel migrating upstream at the ladder, located at the R.H. Saunders Hydroelectric Dam on the St. Lawrence River, remains at a very low level (see Section 2.3). The low levels of upstream eel migration suggest that the abundance of large eel in the upper St. Lawrence River and Lake Ontario will remain low for at least the next decade.

Yellow eel abundance in the upper St. Lawrence River and eastern Lake Ontario were measured with three

assessment programs during 2007. Bottom trawling in the Bay of Quinte has been conducted since 1974 as part of the fish community index program (Section 2.5). The average catch of American eel for 1974 to 1994 was 0.94 eels per trawl; however no eels were captured in the 260 trawls conducted between 2003 and 2007. This suggests that eels are at a very low abundance in the Bay of Quinte.

Quantitative electrofishing has been conducted at in the upper St. Lawrence River in the Mallorytown area and in the east end of Lake Ontario (Main Duck Island and Yorkshire Bar) for 14 years and 24 years, respectively. Fishing is conducted during both the day-time and the night-time. During 2007, fishing was conducted by Dr. J. Casselman, L. Marcogliese and J. Rorabeck of Queens University with funding supplied by Ontario Commercial Fisheries Association and Ontario Ministry of Natural Resources. At Main Duck Island, 36 transects were surveyed during 2007. The average transect was 0.35 ha in area and 517 m in length. Only one eel was captured during this part of the survey. At Mallorytown, 23 transects were surveyed. The average area of each transect was 0.28 ha, and length was 420 m. In total, four eels were captured in 2007 at Mallorytown. At both locations and times of day, the catch rates were not statistically different than the previous year, and were not statistically different than 0. These low catch rates continue the trend of decreasing abundance of American eel in these locations (Fig. 7.3.1).

Nearshore trapnetting was conducted in the Lake St. Francis portion of the St. Lawrence River, East Lake, West Lake, upper Bay of Quinte, and Toronto Harbour using the NSCIN fish community index protocol (see Section 2.7). All of these areas are within the historical range of the eel; however, eel were only captured at Lake St. Francis (0.33 eel per net).

American eel will be officially listed as Endangered in the Province of Ontario beginning June 30, 2008. Also, the Committee on the Status of Endangered Wildlife in Canada recommended that American eel be identified as a species of 'Special Concern' under the Canadian Species at Risk Act (Table 7.3.1). This recommendation has lead to additional efforts to protect American eel in Canada.

Actions taken by the Lake Ontario Management Unit during 2007 to address the declining abundance of eel included:

- collaborating with Ontario Power Generation on the operation of the eel ladder at the R.H. Saunders Hydroelectric Dam (see Section 2.3),
- participating in the development of a management plan for American eel in Canadian waters in cooperation with the Department of Fisheries and Oceans Canada and the Province of Quebec,
- participating in the development of a restoration plan for American eel in the waters of Lake Ontario and the upper St. Lawrence River in cooperation with the Great Lakes Fisheries Commission, New York State Department of Environmental Conservation, United States Fish and Wildlife Service, Department of Fisheries and Oceans Canada and the Province of Quebec,
- negotiating with Ontario Power Generation to develop an action plan to improve eel abundance in Lake Ontario and the upper St. Lawrence River and improve passage of eel around hydroelectric generating facilities in the St. Lawrence River,
- assisteing Ontario Power Generation in health assessment and stocking of 436,907 glass eel into the upper St. Lawrence River (see Section 7.1),
- working with Ontario Commercial Fisheries Association to evaluate the survival of stocked eel,
- conducting boat electrofishing (15.6 km) in the area of eel stocking (however no eel were captured),
- facilitating development of a decision support tool that will identify barriers to eel migration and prioritize eel habitat restoration activities,
- promoting a bi-national approach to eel management by participating in the American Fisheries Society symposium on 'Governance of Fisheries Issues' and,
- participating in meetings with the Atlantic States Marine Fisheries Commission.

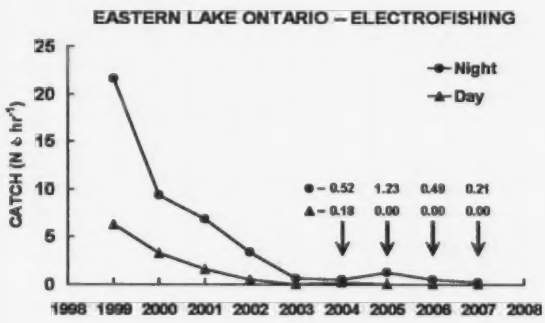

FIG. 7.3.1. Electrofishing catch of American eel (numbers caught per hr) in eastern Lake Ontario, separated by day and night for a recent period of 1999-2007.

8. Research Activities

8.1 Offshore Food Web

Effects of Exotic Species On The Potential For Lake Ontario To Support A Re-Introduced Bloater Population

Investigator: T. J. Stewart, Lake Ontario Management Unit and University of Toronto at Mississauga

Beginning in the 1980s, a succession of non-native invertebrates colonized Lake Ontario and precipitated lake wide disruptive changes to the food web during the 1990s. The invasive *Bythotrephes longimanus* was already established and another predatory cladoceran, *Cercopagis pengoi* invaded. *Diporeia* spp., the previously dominant offshore benthic invertebrate, disappeared from large regions of the lake coincident with the continuing expansion of dreissenid mussels to greater depths. Fish communities also changed. Threespine stickleback (*Gasterosteus aculeatus*), a native prey-fish species, increased in abundance in the offshore and the invasive round goby (*Neogobius melanostomus*) began expanding its distribution from nearshore to deeper waters. Alewife (*Alosa psuedoharengus*), rainbow smelt (*Osmerus mordax*), and juvenile lake trout (*Salvelinus namaycush*) shifted their distribution to greater depths. This project is assembling information to quantitatively assess trophic interactions in order to better understand the recent Lake Ontario offshore food web. The eventual aim will be to use this information to describe past, present and possible future food web structures, and to predict the likely ecological consequences of bloater re-introduction.

In 2007, we continued to assemble and analyze information to quantify the components of the Lake Ontario food web. Here we report on recent analysis of alewife diets and habitat partitioning between Chinook salmon and rainbow trout.

In Lake Ontario, alewife play a pivotal role in structuring the food web and transfer lower trophic level production to top predators. In the 1990s, the Lake Ontario ecosystem was dramatically altered due to continued invasions of exotic species and associated biotic changes. We described the diet and zooplankton prey selection of adult (>109 mm TL) and sub-adult (<109 mm TL) alewife in 2004 and 2005 across seasons and depths, and compare our results to a similar pre-1990 study to assess how alewife diets have responded to post-1990 ecosystem change. Adult alewife consumed primarily zooplankton prey at bottom depths <70 m and primarily *Mysis* at bottom depths >70 m. *Mysis* dominated the diets of adult alewife in all seasons except during the summer of 2004 when zooplankton dominated. *Mysis* dominated the diets of sub-adult alewife during early and late spring and zooplankton dominated the diets in summer and fall. *Bythotrephes* and *Cercopagis* were observed in the diets of both sub-adult and adult alewife. *Diporeia* was observed only rarely in adult alewife diets. *Bythotrephes* and *Cercopagis* were selected by adult and sub-adult alewife in most seasons. All cladocerans were selected in early and late spring by adult and sub-adult alewife. Only small cladocerans were selected by sub-adult alewife in summer and fall. All other cladocerans were avoided in summer and fall by both adults and sub-adult alewife. Alewife diets changed after 1990 with an increase in the consumption of *Mysis*, a decline in the consumption of zooplankton, the replacement of other large cladocerans in the diet by *Bythotrephes* and *Cercopagis*, and a decline in the consumption of cyclopoid copepods and small cladocerans. The combined effect of the invasive predatory cladocerans in Lake Ontario may be to provide alternative prey for alewife, reducing predation on other large cladocerans, and reducing the availability of small cladocerans and cyclopoid copepods in late summer and fall. The increased prevalence of *Mysis* and common occurrence of predatory cladocerans in the diet of alewife means that alewife have shifted to a higher trophic position. Further modeling studies are underway to quantitatively assess the effect of these diet changes on the growth, production, consumption and trophic transfer efficiency of alewife.

Chinook salmon (*Onchorynchus tshawytscha*) and rainbow trout (*Onchoryncus mykiss*) are important, non-native, top predators in the Great Lakes but little is known about their distributions. We described their seasonal catch depth and bottom depth distribution and temperature of occupancy from 1997-2005 in Lake Ontario using angler catch rates and a cross-validated model of temperatures. We tested the hypotheses that these species partition habitat, tested for differences in occupied temperatures, and assessed trends. In April, Chinook salmon were caught deeper (~8-11 m) than rainbow trout (~4-7 m) but both species were found nearshore at a bottom depth of ~20 m. Both species moved deeper and farther offshore occupying similar habitat in May and Jun. Catch depth distributions were similar, but rainbow trout were found further

offshore (~40-70 m) than Chinook salmon (~35-55 m) in Jul and Aug. In Sep, Chinook salmon moved closer to shore (~25-45 m) and to shallow water (~10-14 m), while rainbow trout remained offshore (~40-70 m) in deeper water (~12-21 m). The species occupied significantly different habitats except during May and Jun. Seasonal mean occupied temperatures were not significantly different between the species and ranged from ~13-15 °C during Aug and Sep. There was a trend to an increasing depth of capture for both species, a trend to increasing bottom depth of capture for rainbow trout but no trends in occupied temperatures. Lake Ontario Chinook salmon and rainbow trout segregated in space but occupied similar temperatures, different then previously assumed in bioenergetic models, and may have moved further offshore and deeper with their prey.

This research is changing our understanding of trophic relationships in offshore Lake Ontario food web and will have implications to the future rehabilitation and management of the fish community. This research relied on cooperation of the United States Geological Survey (USGS), New York State Department of Environmental Conservation (NYDEC), and the Department of Fisheries and Oceans. Support for the project was provided by the Canada-Ontario Agreement, the Great Lakes Fish and Wildlife Restoration Act, the Great Lakes Fishery Commission, and the National Sciences and Engineering Research Council.

8.2 Hemimysis

Bloody red shrimp – a new invader in Lake Ontario

Investigator: T. Schaner, Lake Ontario Management Unit

Hemimysis anomala is an invasive species that was first detected in the Great Lakes in 2006. It originated in the Ponto-Caspian region of eastern Europe, spread to western Europe in the 1990s, and was probably brought to the Great Lakes in ballast water of transoceanic ships. The first report of *Hemimysis* in Lake Ontario came from the Pickering Nuclear Generating Station, where it was found in the intake water in the late fall of 2006.

In 2007, the Lake Ontario Management Unit initiated a program to document the progress of the invasion. The efforts in the first year concentrated on describing the distribution of the new invader around the lake. We surveyed six locations along the north shore of Lake Ontario between Whitby and Kingston using night-time surface plankton tows, and deployed bottle traps at three additional locations (Fig. 8.2.1). Our sampling was complemented by efforts by the Department of Fisheries and Oceans.

The findings in 2007 suggest that in Canadian waters *Hemimysis* has spread through the western and central portion of the lake. In the U.S. it was only found in two locations, but the locations span the entire U.S. waters. Based on the combined findings in 2007, it is thus possible that *Hemimysis* may already be present throughout the lake, albeit at low densities and patchy distribution.

In 2008, we will continue the monitoring program, but will also initiate assessment of densities, distribution and trophic dynamics in order to assess the impact of this new invader.

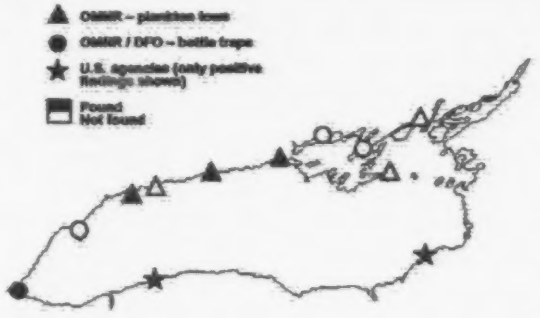

FIG. 8.2.1. Sampling effort and sightings of *Hemimysis anomala* in Lake Ontario in 2007.

8.3 Predation on Larval Fish

Quantifying sources of mortality for larval yellow perch

Investigators: T.B. Johnson, Aquatic Research Development Section; N.D. Legler, L. Carreon-Martinez, D. Heath, University of Windsor; S.A. Ludsin, NOAA-Great Lakes Environmental Research Laboratory

Early life mortality in fishes is extremely high—more than 99% of all hatched larvae die within the first few months of life. Two mechanisms have been proposed to explain this mortality—predation effects by larger fish and/or starvation effects due to lack of suitable prey. As part of a 4-year study sponsored by the Great

Lakes Fishery Commission, we are undertaking a series of laboratory and field experiments to try to measure the importance of predation and starvation mortality in the survival of yellow perch. In 2006 and 2007, over 5,000 stomachs of potential predators were examined and larval fish were found in <0.1% of those. Laboratory experiments revealed that larval fish digest very rapidly in a predator's stomach—complete digestion can occur within 2 hours for small (<10 mm) larvae, and within 20 hours for small juvenile fish (~35 mm). Digestion rate was faster at higher temperatures and for smaller fish. An advanced genetic technique (quantitative real-time polymerase chain reaction) was used to search for evidence of larval fish that was too small to be seen by visual examination. In essence, even after a larval fish is physically digested, fragments of DNA remain. These fragments can be identified to species, and the amount of DNA measured to determine the potential number of larval fish consumed by a predator. The results from the field, lab feeding, and genetic work are being combined with bioenergetic models to determine the total number of larval fish that may have been eaten by resident populations of different predators. The project will continue for 2 more years, refining the genetic techniques, completing the bioenergetic modelling, and assessing the relationship between zooplankton (larval fish food) species composition and abundance relative to larval fish growth and survival.

8.4 Predation on American Eel Elvers

Investigators: T.B. Johnson, Aquatic Research Development Section and A. Mathers, Lake Ontario Management Unit

American eel were an historically abundant top predator in the Upper St. Lawrence River and eastern Lake Ontario. However, stocks collapsed by the 1990s due to habitat loss, mortality in hydroelectric generating turbines, and overfishing (see section 2.3). One proposal to rebuild the population includes stocking large numbers of young eels (elvers) into areas of suitable habitat where the eels can mature and hopefully contribute to the spawning population. When these eels are first introduced into the new habitat they are very vulnerable to predation by resident fishes. In a series of laboratory experiments we evaluated the degree of predation on elvers by round goby, yellow perch, and bluegill sunfish over three different substrates (cobble, sand, and mud). Within 24 hrs bluegill had consumed 100% of the elvers, while yellow perch (25%) and round goby (1.6%) consumed considerably fewer. While not statistically different, predation was highest over rock substrate, and lowest over sand. These results suggest that mortality on newly stocked elvers can be considerable, and that the composition of the resident fish community is more important than the underlying substrate.

9. Partnerships

9.1 Nearshore Fish Community Trapnet Studies

Nearshore community index netting (NSCIN), a provincially standardized trapnet program designed originally on inland lakes to evaluate littoral zone fish communities, was initiated on Lake Ontario in the Bay of Quinte from 2001-2005. In 2006, the NSCIN program was conducted on Hamilton Harbour and the Toronto Waterfront area with partnerships involving Ontario Ministry Natural Resources, Fisheries and Oceans Canada, and Toronto Region Conservation Authority. The Ministry of Natural Resources' Lake Ontario Management Unit (LOMU) provided equipment and specific expertise with the NSCIN program while partners provided experienced staff with local knowledge. The partnerships proved very successful.

In 2007, funding from COA allowed for NSCIN to be conducted in five areas: Lake St. Francis (St. Lawrence River), the upper Bay of Quinte, East and West Lakes (two Lake Ontario embayments on the southwest side of Prince Edward County), and the Toronto waterfront area (see Section 2.7). Three of these projects involved partnerships. The Lake St. Francis netting involved partnering with the Raisin Region Conservation Authority; the East Lake field project was conducted by a local commercial fisher, Mr. David Baverstock; and the Toronto waterfront area netting was again accomplished in partnership with the Toronto Region Conservation Authority. COA has committed funding for more NSCIN projects to be conducted in 2008 and 2009.

Some of these NSCIN netting location are Areas of Concern (AOC) with ongoing Remedial Action Plans (RAP). As well, Fisheries Management Plans (FMP) are planned or being written for these AOCs (see Section 7.2), and NSCIN is being considered as a method for setting and evaluating the success of fish community targets. Results of the program (see Section 2.7 and previous LOMU Annual Reports) indicate that NSCIN may provide a good method for monitoring fish community restoration in AOCs such as Hamilton Harbour, the Toronto waterfront area, the Bay of Quinte and Lake St. Francis, and for comparing with other lakes and embayments.

9.2 St. Lawrence River Muskellunge Spawning and Nursery Site Identification

The muskellunge (*Esox masquinongy*) is the largest game fish in Ontario waters. Its scattered provincial distribution is made up of several genetically distinct populations. The St. Lawrence River population produces the largest individuals in the province, and supports an important sport fishery. Concern regarding this population led to the creation of The St. Lawrence River Esocid Working Group under the supervision of the Lake Ontario Committee, of the Great Lakes Fishery Commission. The Esocid Working Group consists of members from New York State Department of Environmental Conservation (NYSDEC), the Ontario Ministry of Natural Resources (OMNR), SUNY College of Environmental Science and Forestry and the Royal Ontario Museum (ROM).

In the past the Esocid Working Group produced management plans pertaining to St. Lawrence River muskellunge, the most recent being the Update of the Strategic Plan For Management of The St. Lawrence River Muskellunge Population and Sport Fishery Phase III: 2003-2010. One objective outlined in the report was the protection of muskellunge spawning and nursery habitats. However, these habitats were not well documented or identified within the St. Lawrence River. Consequently the OMNR conducted a young-of-the-year seining program from 1989 to 1995 in an effort to identify nursery sites within the Canadian waters of the St. Lawrence River. Efforts were discontinued following this period.

During 2005, 2006 and 2007, efforts to identify muskellunge nursery habitats were renewed through a partnership between Muskies Canada Inc. (MCI - Gananoque Chapter), Parks Canada (St. Lawrence Islands National Park), Kemptville District MNR, Fisheries and Oceans Canada (Prescott), and the Lake Ontario Management Unit (LOMU). During 2007, sampling occurred from Aug 20-30 during which 45 seining events were completed. In total, 4,836 fish were captured, representing 28 species. Banded killifish (16.2%), brook silverside (15.7%), yellow perch (14%), rock bass (10.5%) and bluntnose minnow (10.5%) were the most abundant species. Pugnose shiner (*Notropis anogenus*), listed as endangered by the Committee on the Status of Endangered Wildlife in Canada (see Section 7.3), were captured during this program at 12 sites. This important observation highlights the importance of seining programs to the identification of biological diversity of the St.

Lawrence River.

During 2007, 7 muskellunge were captured. Two were captured at sites which not previously confirmed as muskellunge nursery areas, while 5 were captured at previously confirmed sites. These data are being incorporated into NRVIS mapping of muskellunge nursery habitats by MNR - Kemptville District Office and shared with partner agencies.

9.3 Base of the food web assessment

In partnership with the Department of Fisheries and Oceans (DFO), OMNR's Aquatic Research and Development Section (ARDS) and Lake Ontario Management Unit (LOMU) resurrected a biomonitoring program in eastern Lake Ontario that had ended in 1995 due to budget constraints. The program involves bi-weekly sampling of Station 81 (44.01708 N, 76.67227 W) located in approximately 38 m of water in the Kingston basin. Analysis of the samples collected will provide information on physical limnology (water temperature, oxygen, and light), primary production (algal composition and abundance and the microbial food web), and secondary production (zooplankton and benthic invertebrates). Summer fish assessment data (trawls and gillnets) collected in the vicinity will allow scientists to evaluate the types and amount of food that ultimately sustains the top predator fish. While results within any one year will provide basic descriptions of composition and abundance of the food web components, the resurrection of the long-term index will allow scientists and managers to better describe changes that have occurred in the available energy following the arrival of dreissenid (zebra and quagga) mussels, round gobies and other invasive organisms, shifts in nutrient regimes, climate change, and other large scale ecological changes that will ultimately affect the amount of fish available for sport and commercial harvest.

9.4 Large Salmonid Predation Impacts on Post-smolts

The survival of juvenile Atlantic salmon, lake trout, rainbow trout, brown trout, and coho salmon (not Chinook salmon) declined the mid 1990s. Increased water clarity led to an offshore re-distribution of alewife during spring. We have hypothesized that, with fewer prey fish (alewife and smelt) to act as a buffer, post-smolt/stocked juvenile salmonids have became a greater target for large salmonid predators.

We propose to:

- quantify the spatial and temporal components of the diet of large salmonids during and after the spring smolt/stocking events,
- determine the distribution shifts in salmonids and prey fish through the spring,
- model the predation intensity on small salmonids under scenarios of higher and lower prey fish density, and
- simulate past prey density and distribution to test hypotheses related past changes in juvenile salmonid survival.

Fish will be captured with multi-mesh gangs of suspended (method by which nets are properly deployed and floating in water column at desired depth strata) and bottom gillnets using a randomly stratified sampling design (See Section 2.2). We will stratify by water depth and distance offshore. Sampling will be conducted from April through May in Lake Ontario near streams where Atlantic salmon have been intensively stocked. In addition, identification of prey will be based on bones and otoliths for largely digested specimens thereby reducing unidentifiable components to <5% (based on past experience). After the 1st year, smaller mesh gillnet may be deployed pending growth and size of target species.

We have partnered with Dr. Mart Gross and Blake Turner at the University of Toronto to conduct this study. As part of his graduate studies, Blake is analyzing the stomach contents of salmonids caught in the survey, and synthesizing the data.

9.5 Water Quality Assessment at Potential Coregonid Spawning Shoals in Hamilton Harbour

Water quality degradation and fish habitat loss in Hamilton Harbour are primary issues of the Hamilton Harbour Fish Management Plan (FMP) and among the main reasons for listing Hamilton Harbour as an Area of Concern (AOC). The Remedial Action Plan (RAP) has accomplished significant improvements in dissolved oxygen (DO) in Hamilton Harbour, and further improvements are expected. Shoal habitat for fish has been created through the RAP and further shoal creation would be implemented through the FMP. These shoals are critical to the FMP because they would help to restore warmwater and coldwater fish populations such as lake herring and lake whitefish in both Hamilton Harbour and western Lake Ontario. This project will determine if water quality is meeting Hamilton Harbour RAP's newly developed

(ongoing) AOC delisting targets, and accordingly, if DO is suitable for incubation and hatching of lake herring and lake whitefish eggs at existing or potential shoal locations in Hamilton Harbour. Water quality at the shoals will be compared to water quality at center station, to assess how representative this historically monitored station is with respect to the nearshore zones. Three spawning shoal locations for lake herring and lake whitefish have been identified: (in priority) north-east, north, and west. To examine habitat suitability at these locations, in situ stationary electronic water quality sensors will continuously record DO and temperatures from winter to spring thus bracketing the incubation and hatching time period of lake herring and lake whitefish eggs. An additional monitoring location would be added each year during this study. Water quality sensors will be deployed by EC, and DFO will lead the data analysis. Water quality data will be reported through the Hamilton Harbour RAP Water Quality Technical Team. This data will contribute to the EC water quality modeling of Hamilton Harbour to address AOC delisting targets.

For analytical and technical support, we have partnered with Dr. Agnes Richards of the Great Lakes Laboratory for Fisheries and Aquatic Science, DFO, and Dr. Veronique Hiriart-Baer and Dr. Ram Yerubandi of the Aquatic Ecosystem Management Research Division, National Water Research Institute, Environment Canada.

Appendix A:
Lake Ontario Management Unit Staff, 2007

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Gavin Christie – A/Assessment Supervisor
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Jim Bowlby – Assessment Biologist
Jim Hoyle – Assessment Biologist
Ted Schaner – Assessment Biologist
Marc Desjardins –Management Biologist
Colin Lake – Operations Supervisor
Kelly Sarley – Database Technician, Computer Operator
Dale Dewey – Operations Coordinator
Wayne Miller – Senior Technician, Base Operations
Charles Wood – Vessel Master
Dave Goodfellow – Great Lakes Technician
Tom Lawrence – Great Lakes Technician
Steve McNevin – Great Lakes Technician
Unclassified Staff:
Gord Meadows – Great Lakes Fisheries Technician
Tyson Scholz – Great Lakes Fisheries Technician
Matt Brown – Great Lakes Fisheries Technician
Ryan Redmond – Great Lakes Fisheries Technician
Steve Wickens – Great Lakes Fisheries Technician
Alan McIntosh – Boat Captain
Shannon Kelly – Student Fisheries Technician
Amy McPherson – Student Fisheries Technician
Casey Melbourne – Student Fisheries Technician
Dillon Robinson – Student Fisheries Technician

LAKE ONTARIO ENFORCEMENT SECTION – GLENORA
Derrick Humber – Enforcement Supervisor, Lake Ontario and Lake Erie
Gord Rooney – Conservation Officer
Edwin Van Den Oetelaar – Conservation Officer
Randy Tippin – Conservation Officer (Vineland)

AQUATIC RESEARCH AND DEVELOPMENT SECTION – GLENORA
Dr. Tim Johnson – Research Scientist
Les Stanfield – Research Biologist
Laurie Allin – Research Technician
Nina Jakobi – Research Technician
Julie Vaillancourt – Student Research Technician

Appendix B. Lake Ontario Management Unit 2007 Operational Staff Field and Lab Schedule

Field or lab project	Dates	Species assessed, monitored or stocked	Length of data series (yrs)	Lead biologist	Lead technician
Bay of Quinte Recreational Fishery (Ice Fishery)	Feb 4 - Feb 28	Walleye, smallmouth bass, largemouth bass, northern pike	15	Hoyle	Dewey
Ganaraska Fishway - Rainbow Trout Assessment	Mar 19 - Apr 20	Adult rainbow trout	34	Bowlby	Miller
Lake Trout Tug Stocking	Apr 16 - May 4	Juvenile lake trout	n/a	Daniels	Wood
Large Salmonid Predation Impacts on Post-smolts	May 2 - May 30	Chinook and coho salmon, lake and brown trout	1	Bowlby	Lawrence, Goodfellow, McIntosh
Whitefish Commercial Catch Sampling	Seasonal	Lake whitefish	21	Hoyle	McNevin
Moses Saunders Eel Ladder Monitoring	May 23 - Oct 28	Migrating American eel	34	Mathers	Dewey
Eastern Lake Ontario and Bay of Quinte Community Index Netting	Jun 27 - Sept 6	Eastern Lake Ontario and the Bay of Quinte fish community	49	Hoyle	Dewey
Lake-wide Hydroacoustic Assessment of Prey Fish	Aug 14-25	Alewife, rainbow smelt and three-spine stickleback	17	Schaner	-
West Lake Nearshore Community Index Netting	Aug 7- Aug 21	Nearshore fish community	1	Hoyle	Meadows
Lake St. Francis Nearshore Community Index Netting	Aug 13 - Aug 31	Nearshore fish community	1	Schaner	Goodfellow Dewey
Upper Bay of Quinte Nearshore Community Index Netting	Sep 4 - Sep 21	Nearshore fish community	6	Hoyle	McNevin
East Lake Nearshore Community Index Netting	Sep 5 - Sep 9	Nearshore fish community	1	Hoyle	Baverstock (partner) and Dewey
St. Lawrence River Fish Community Index Netting—Thousand Islands	Sep 10 - Oct 4	St. Lawrence River fish community	23	Schaner	Lawrence
Hemimysis Survey	Sep 10 - Sep 13	*Hemimysis anomala* - "bloody red shrimp"	1	Schaner	Dewey Wood
Toronto Islands Nearshore Community Index Netting	Sep 17 - 28	Nearshore fish community	2	Hoyle	Goodfellow Dewey
Credit River Chinook Assessment and Egg Collection	Oct 1 - Oct 4	Adult chinook salmon	33	Bowlby	Goodfellow
Juvenile Atlantic Salmon Electrofishing	Oct 9 - Oct 25	Atlantic salmon	1	Bowlby	McNevin
Age and Growth	Year-round	Multiple species	n/a	Multiple	all

Appendix C. Atlantic salmon stocked in the Province of Ontario waters of Lake Ontario, 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
ATLANTIC SALMON - ADVANCED FRY								
COBOURG BROOK								
Ball's Mill	5	2006	Normandale	LaHave/Normandale	5	1.3	None	23,701
Crossen Rd.	5	2006	Partnership	LaHave/Normandale	4	0.2	None	9,000
Dale Rd.	5	2006	Normandale	LaHave/Normandale	5	1.3	None	21,271
Pollock Rd.	5	2006	Partnership	LaHave/Normandale	4	0.2	None	9,100
								63,072
CREDIT RIVER								
Belfountain	5	2006	Normandale	LaHave/Normandale	5	1.5	None	25,406
Black Cr. - 6th Line	5	2006	Normandale	LaHave/Normandale	5	1.3	None	15,388
Black Cr. - 15th Sideroad	5	2006	Normandale	LaHave/Normandale	5	1.3	None	9,994
Black Cr. - 17th Sideroad	5	2006	Normandale	LaHave/Normandale	5	1.3	None	5,004
Black Cr. - Limehouse	5	2006	Normandale	LaHave/Normandale	5	1.3	None	8,988
Forks of the Credit - Dominion St.	5	2006	Normandale	LaHave/Normandale	5	1.5	None	24,432
Forks of the Credit Prov. Park	5	2006	Normandale	LaHave/Normandale	5	1.4	None	50,690
Rogers Cr.	5	2006	Normandale	LaHave/Normandale	5	1.3	None	2,483
West Credit - Collins Property	5	2006	Partnership	LaHave/Normandale		0.5	None	4,960
	5	2006	Partnership	LaHave/Normandale		1.1	None	688
								148,033
DUFFIN CREEK								
East Duffins Cr. - Claremont Field Centre	5	2006	Normandale	LaHave/Normandale	5	1.3	None	30,686
East Duffins Cr. - Durham Board of Education Outdoor Centre	5	2006	Normandale	LaHave/Normandale	5	1.4	None	8,401
East Duffins Cr. - Ganatsekiagon Cr.	5	2006	Partnership	LaHave/Normandale	4	0.4	None	9,931
East Duffins Cr. - Mitchell Cr.	5	2006	Partnership	LaHave/Normandale	4	0.4	None	9,932
East Duffins Cr. - Uxbridge/Pickering Townline	5	2006	Normandale	LaHave/Normandale	5	1.3	None	10,227
								69,177
ATLANTIC SALMON - FALL FINGERLINGS								
COBOURG BROOK								
Danforth Rd. - bridge	10	2006	Normandale	Sebago/Normandale	10	14.4	None	6,499
Danforth Rd. - Hie/McNichol properties	10	2006	Normandale	Sebago/Normandale	10	14.2	None	8,942
								15,441

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Appendix C. Atlantic salmon stocked in the Province of Ontario waters of Lake Ontario, 2007 continued.

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SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
CREDIT RIVER								
West Credit - Collins Property	10	2006	Partnership	LaHave/Normandale		13.5	None	514
DUFFINS CREEK								
East Duffins Cr. - Paulynn Park	11	2006	Partnership	LaHave/Normandale		6.1	None	486
			ATLANTIC SALMON - SPRING YEARLINGS					
COBOURG BROOK								
Danforth Rd. - bridge	4	2005	Normandale	LaHave/Normandale	17	27.3	None	5,891
Danforth Rd. - Hie/McNichol properties	4	2005	Normandale	LaHave/Normandale	17	24.3	Ad/T-bar tag	2,882
	4	2005	Normandale	LaHave/Normandale	17	24.3	Ad	3,001
Cobourg Creek Golf Course	4	2005	Partnership	LaHave/Normandale	16	72.2	None	2,096
								13,870
CREDIT RIVER								
Boston Mills	4	2005	Normandale	LaHave/Normandale	17	26.1	None	9,306
Inglewood	4	2005	Normandale	LaHave/Normandale	17	26.2	None	8,907
Terra Cotta		2005	Normandale	LaHave/Normandale	17	25.3	None	9,914
West Credit - Collins Property	4	2005	Partnership	LaHave/Normandale		9.9	None	156
								28,283
DUFFINS CREEK								
East Duffins Cr. - Greenwood C.A.	4	2005	Normandale	LaHave/Normandale	17	25.4	None	6,232
East Duffins Cr. - Paulynn Park	4	2005	Normandale	LaHave/Normandale	17	25.4	None	6,267
								12,499
			ATLANTIC SALMON - SUB-ADULTS					
COBOURG BROOK								
Danforth Rd. - bridge	4	2004	Codrington	LaHave/Normandale	29	51.9	PIT tag	863
TOTAL - ATLANTIC SALMON ADVANCED FRY								280,282
TOTAL - ATLANTIC SALMON FALL FINGERLINGS								16,441
TOTAL - ATLANTIC SALMON SPRING YEARLINGS								54,652
TOTAL - ATLANTIC SALMON SUB-ADULTS								863
TOTAL - ATLANTIC SALMON								352,238

Appendix C. Brown trout stocked in the Province of Ontario waters of Lake Ontario , 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
BROWN TROUT - FALL FINGERLINGS								
LAKE ONTARIO								
Ashbridge's Bay Ramp	11	2006	Ringwood	Ganaraska/Normandale	11	21.4	None	10,192
Athol Bay	11	2006	Ringwood	Ganaraska/Normandale	11	21.4	None	20,212
Burlington Canal	11	2006	Ringwood	Ganaraska/Normandale	11	20.7	None	10,080
Frenchman's Bay	11	2006	Ringwood	Ganaraska/Normandale	11	23.3	None	10,011
Lakefront Promenade	11	2006	Ringwood	Ganaraska/Normandale	11	20.7	None	10,192
Oshawa Harbour	11	2006	Ringwood	Ganaraska/Normandale	11	22.1	None	10,132
Whitby Harbour	11	2006	Ringwood	Ganaraska/Normandale	11	22.1	None	10,260
								81,079
BROWN TROUT - SPRING YEARLINGS								
DUFFINS CREEK								
401 Bridge	5	2005	Harwood	Ganaraska/Normandale	19	51.0	RV	10,655
LAKE ONTARIO								
Ashbridge's Bay Ramp	4	2005	Harwood	Ganaraska/Normandale	18	57.0	RV	8,488
	5	2005	Harwood	Ganaraska/Normandale	19	66.5	RV	6,540
Athol Bay	5	2005	Harwood	Ganaraska/Normandale	19	61.5	RV	13,309
Bluffer's Park	4	2005	Harwood	Ganaraska/Normandale	18	55.6	RV	8,612
	5	2005	Harwood	Ganaraska/Normandale	19	58.7	RV	6,395
Bronte Beach Park	4	2005	Chatsworth	Ganaraska/Normandale	16	40.7	RV	14,992
Burlington Canal	4	2005	Chatsworth	Ganaraska/Normandale	16	41.7	RV	14,813
Fifty Point CA	4	2005	Chatsworth	Ganaraska/Normandale	16	37.8	RV	14,983
Humber Bay Park	4	2005	Chatsworth	Ganaraska/Normandale	16	41.7	RV	9,955
Jordan Harbour	4	2005	Chatsworth	Ganaraska/Normandale	16	37.8	RV	9,989
Millhaven Wharf	4	2005	Harwood	Ganaraska/Normandale	18	53.6	RV	9,969
	5	2005	Harwood	Ganaraska/Normandale	19	56.4	RV	5,082
Oshawa Harbour	4	2005	Harwood	Ganaraska/Normandale	18	59.1	RV	11,269
Port Dalhousie East	4	2005	Chatsworth	Ganaraska/Normandale	16	39.0	RV	25,160
								159,556
TOTAL - BROWN TROUT FALL FINGERLINGS								**81,079**
TOTAL - BROWN TROUT SPRING YEARLINGS								**170,211**
TOTAL - BROWN TROUT								**251,290**

Appendix C. Chinook salmon stocked in the Province of Ontario waters of Lake Ontario, 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
			CHINOOK - SPRING FINGERLINGS					
BOWMANVILLE CREEK								
CLOCA Ramp	4	2006	Ringwood	Wild - Credit R.	5	4.7	None	**20,497**
BRONTE CREEK								
2nd Side Road Bridge	4	2006	Ringwood	Wild - Credit R.	5	3.4	None	27,001
5th Side Road Bridge	4	2006	Ringwood	Wild - Credit R.	5	4.3	None	25,622
								52,623
CREDIT RIVER								
Eldorado Park	4	2006	Ringwood	Wild - Credit R.	5	3.9	None	28,758
Huttonville	4	2006	Ringwood	Wild - Credit R.	5	3.9	None	28,757
Norval	4	2006	Ringwood	Wild - Credit R.	5	3.4	None	28,000
								85,515
DON RIVER								
Donalda Golf Club	4	2006	Ringwood	Wild - Credit R.	6	5.0	None	**15,679**
HIGHLAND CREEK								
Colonel Danforth Park	4	2006	Ringwood	Wild - Credit R.	5	4.3	None	**15,372**
HUMBER RIVER								
East Branch Islington	4	2006	Ringwood	Wild - Credit R.	5	5.0	None	**15,370**
LAKE ONTARIO								
Ashbridge's Bay Ramp	4	2006	Ringwood	Wild - Credit R.	5	5.2	None	10,180
Barcovan	5	2006	Ringwood*	Wild - Credit R.	6	5.4	Ad	9,959
Beacon Inn	4	2006	Ringwood	Wild - Credit R.	5	5.4	None	25,553
Bluffer's Park	4	2006	Ringwood	Wild - Credit R.	5	5.2	None	35,673
Burlington Canal	4	2006	Ringwood	Wild - Credit R.	5	3.7	None	55,008
Consecon Robinson Pt	5	2006	Ringwood	Wild - Credit R.	6	6.2	LV	15,085
Lakeport	4	2006	Ringwood	Wild - Credit R.	5	4.7	None	15,372
Oshawa Harbour	5	2006	Ringwood	Wild - Credit R.	6	5.9	None	25,590
Port Dalhousie East	4	2006	Ringwood	Wild - Credit R.	5	4.9	None	102,424
Wellington Channel	5	2006	Ringwood	Wild - Credit R.	6	6.2	LV	15,085
	5	2006	Ringwood*	Wild - Credit R.	6	5.9	Ad	10,036
Whitby Harbour	5	2006	Ringwood	Wild - Credit R.	6	5.9	None	25,590
								345,555
TOTAL - CHINOOK SALMON								**550,611**

* Pen-Imprinted

Appendix C. Lake trout stocked in the Province of Ontario waters of Lake Ontario, 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
				LAKE TROUT - SPRING YEARLINGS				
LAKE ONTARIO								
Cobourg Harbour Pier	4	2005	Harwood	Seneca Lake/Harwood	17	28.8	AdRV	41,974
Fifty Point CA	4	2005	Harwood	Seneca Lake/Harwood	17	29.3	AdRV	65,315
	4	2005	Harwood	Slate Islands/Chatsworth	18	37.0	AdRV	12,687
North of Main Duck Sill	4	2005	Harwood	Michipicoten Island/Dorion	18	40.8	AdRV	53,612
	5	2005	Harwood	Michipicoten Island/Dorion	19	42.9	AdRV	3,511
	4	2005	Harwood	Seneca Lake/Harwood	17	34.9	AdRV	12,708
	4	2005	Harwood	Slate Islands/Chatsworth	18	36.8	AdRV	11,776
	5	2005	Harwood	Slate Islands/Chatsworth	19	34.8	AdRV	93,351
Pigeon Island	5	2005	Harwood	Slate Islands/Chatsworth	19	41.7	AdRV	10,674
South of Long Point	4	2005	Harwood	Seneca Lake/Harwood	17	32.3	AdRV	64,426
	5	2005	Harwood	Seneca Lake/Harwood	18	34.4	AdRV	78,046
TOTAL - LAKE TROUT								448,080

Appendix C. Rainbow trout stocked in the Province of Ontario waters of Lake Ontario, 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
RAINBOW TROUT - FRY								
LAKE ONTARIO								
Amherst Is. Ferry Dock (Millhaven)	9	2007	Partnership	Ganaraska/Normandale			None	12,500
RAINBOW TROUT - FALL FINGERLINGS								
DON RIVER								
Bathhurst S. of 16th Ave.	11	2007	Partnership	Ganaraska/Normandale	7	6.9	None	11,735
RAINBOW TROUT - SPRING YEARLINGS								
BRONTE CREEK								
2nd Side Road Bridge	4	2006	Normandale	Ganaraska/Normandale	13	22.5	AdRV	11,994
Lowville Park	4	2006	Normandale	Ganaraska/Normandale	13	25.8	AdRV	12,002
								23,996
CREDIT RIVER								
Huttonville	4	2006	Normandale	Ganaraska/Normandale	13	24.9	AdRV	11,862
Norval	4	2006	Normandale	Ganaraska/Normandale	13	24.6	AdRV	12,012
								23,874
HUMBER RIVER								
East Branch Islington	4	2006	Normandale	Ganaraska/Normandale	13	23.8	AdRV	16,009
King Vaughan Line	4	2006	Normandale	Ganaraska/Normandale	13	26.4	AdRV	16,109
								32,118
LAKE ONTARIO								
Glenora	5	2006	Harwood	Ganaraska/Normandale	15	30.5	AdRV	7,541
Jordan Harbour	4	2006	Normandale	Ganaraska/Normandale	13	23.0	AdRV	13,506
Millhaven Wharf	5	2006	Harwood	Ganaraska/Normandale	15	35.5	AdRV	9,837
North of Main Duck Sill	5	2006	Harwood	Ganaraska/Normandale	15	30.5	AdRV	5,049
Port Dalhousie East	5	2006	Normandale	Ganaraska/Normandale	15	30.5	AdRV	7,541
								43,474
ROUGE RIVER								
Bruce Cr.	4	2006	Partnership	Wild - Rouge R. / Duffins Cr.	13	9.7	None	8,157
Little Rouge R. at Hwy 48	4	2006	Partnership	Wild - Rouge R. / Duffins Cr.	13	9.7	None	7,918
								16,075
TOTAL - RAINBOW TROUT FRY								12,500
TOTAL - RAINBOW TROUT FALL FINGERLINGS								11,735
TOTAL - RAINBOW TROUT SPRING YEARLINGS								139,537
TOTAL - RAINBOW TROUT								163,772

Appendix C. American eel stocked in the Province of Ontario waters of Lake Ontario, 2007.

SITE NAME	MONTH STOCKED	YEAR SPAWNED	HATCHERY	STRAIN/ EGG SOURCE	AGE (MONTHS)	MEAN WT (G)	MARKS	NUMBER STOCKED
			AMERICAN EEL - ELVERS					
ST. LAWRENCE RIVER								
Ferman's Point	6	2006	Private	Wild - various streams in NB / NS	15	0.2	Tetracycline	98,100
Adelaide Island	6	2006	Private	Wild - various streams in NB / NS	15	0.2	Tetracycline	98,100
East of Mallorytown Landing	6	2006	Private	Wild - various streams in NB / NS	15	0.2	Tetracycline	98,100
TOTAL - AMERICAN EEL								294,300

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